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Attention: Mr. Brad Bradley and Ms. Sheri Bianchin

ENVIRONMENTAL SERVICES

Subject:
2002 Annual Groundwater Monitoring Report
NL Industries/Taracorp Superfund Site
Granite City, Illinois
ARCADIS Geraghty & Miller Project No. CI001003.0007

Chicago, Illinois
30 September 2002

Dear Mr. Bradley and Ms. Bianchin:

On behalf of the NL Industries/Taracorp Superfund Site Group (the Group),
ARCADIS is hereby submitting two (2) copies of the document entitled, "2002
Annual Groundwater Monitoring Report, NL Industries/Taracorp Superfund Site,
Granite City, Illinois."

Contact:
Jack Kratzmeyer

If you should have any questions regarding this submittal, please do not hesitate to
contact the undersigned.

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Sincerely,

ARCADIS G&M, Inc.

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Enclosures (2): 2002 Annual Groundwater Monitoring Report

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2002 Annual Groundwater
Monitoring Report

NL Industries/Taracorp
Superfund Site
Granite City, Illinois

P R E P A R E D F O R

NL Industries/Taracorp
Superfund Site Group

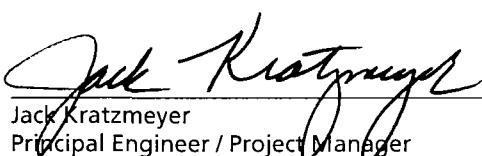


Infrastructure, buildings, environment, communications

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2002 Annual Groundwater
Monitoring Report

NL Industries/Taracorp
Superfund Site
Granite City, Illinois

Prepared for:
NL Industries/Taracorp
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Date:
September 2002

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| | | |
|------------|---|-----------|
| 1.0 | Introduction | 1 |
| 2.0 | Background | 3 |
| 2.1 | Site History | 3 |
| 2.2 | Regional Hydrogeology | 3 |
| 3.0 | Groundwater Investigation | 6 |
| 3.1 | Water Level Measurements | 6 |
| 3.2 | Groundwater Sampling | 6 |
| 3.3 | Monitoring Well Location and Elevation Survey | 7 |
| 4.0 | Results of Chemical Analyses | 8 |
| 4.1 | Main Industrial Site | 8 |
| 4.2 | Remote Fill Areas | 9 |
| 5.0 | Summary of Findings | 10 |
| 6.0 | References | 11 |

Tables

- 1 Groundwater Elevation Data.
- 2 Monitoring Well Location and Elevation Survey Data Results.
- 3 Groundwater Analytical Results.

Figures

- 1 Site Location Map.
- 2 Monitoring Well Location Index.
- 3 Monitoring Well Locations, Main Industrial Site.
- 4 Monitoring Well Location GMMW 125, Main Industrial Site.
- 5 Monitoring Well Location GMMW 126, Main Industrial Site.
- 6 Monitoring Well Locations, Remote Fill Areas-Eagle Park Acres.
- 7 Monitoring Well Locations, Remote Fill Areas-Venice Township.
- 8 Monitoring Well Location GMMW-123, National Steel Corp.
- 9 Groundwater Elevations and Contours, July 22, 2002, Main Industrial Site.

Appendix

- A Groundwater Sampling Logs.
- B Laboratory Data Reports.
- C Data Validation Memorandum.
- D Monitoring Well Location and Elevation Survey Data Results.

1.0 Introduction

This 2002 Annual Groundwater Monitoring Report has been prepared by ARCADIS G&M, Inc. (ARCADIS) on behalf of the NL Industries/Taracorp Superfund Site Group (Site Group) to present the results of groundwater monitoring conducted at the NL Industries/Taracorp Superfund Site (Site) in Granite City, Illinois in July 2002.

On September 7, 1999, ARCADIS submitted a work plan to the U.S. EPA on behalf of the Site Group which was entitled "Pre-Design Investigation Work Plan for Groundwater, NL Industries/Taracorp Superfund Site, Granite City, Illinois" (ARCADIS 2000a). The Work Plan was approved by the U.S. EPA with minor modifications on October 25, 1999, and a final version of the Work Plan was submitted to the agency on August 25, 2000. The purpose of the Pre-Design Investigation was to update the existing groundwater quality database for the Site, as well as determine selected soil and aquifer characteristics. More specifically, ARCADIS designed the Pre-Design Investigation groundwater sampling and analysis program to provide a reproducible set of groundwater quality data using consistent groundwater sampling protocols. In order to determine the effects of sample turbidity on analytical results, groundwater samples were collected using both bailers and low-flow sampling methods. Additionally, laboratory analyses were performed on both filtered and unfiltered samples.

The results of the Pre-Design Investigation are presented in the September 2000 "Pre-Design Investigation Report for Groundwater" (ARCADIS, 2000b). The Pre-Design Investigation concluded the following.

- The relatively low levels of lead that had been detected in monitoring wells in the former source area at the Main Industrial Site are not mobile in groundwater and have not migrated offsite.
- Comparison of the analytical results for bailed-collected, unfiltered samples to the results for low-flow, unfiltered samples indicates the following: the lead concentrations observed in bailed-collected, unfiltered samples during previous groundwater investigations at the Site are attributable to the presence of suspended solids in the samples, which is directly related to the use of bailers to collect the samples and inadequate well development.

Based on the results of the Pre-Design Investigation, which confirmed the limited extent of groundwater impacts at the Site, it was recommended that the groundwater

remedy specified in the Consent Decree be modified to consist of groundwater monitoring only. Accordingly, groundwater monitoring was selected as the final groundwater remedy in the Explanation of Significant Differences (ESD) issued by the U.S. EPA on September 9, 2000.

The July 2002 groundwater monitoring event was conducted in accordance with the U.S. EPA-approved ARCADIS document, "Groundwater Monitoring Plan, NL Industries/ Taracorp Superfund Site," December 2000 (Monitoring Plan) to achieve the requirements of the September 9, 2000 ESD. As part of the monitoring activities, ARCADIS has also completed a review of existing site conditions, historic groundwater quality data, and the fate and transport mechanisms affecting the Site.

2.0 Background

The following discussion of site history and regional hydrogeology has been excerpted from the Pre-Design Investigation Report for Groundwater (ARCADIS, 2000b) and is presented in this report to provide a general understanding of the site background. Details regarding the results of previous groundwater investigations (1982-1995) may be referenced in the Pre-Design Investigation Report for Groundwater.

2.1 Site History

The NL Industries/Taracorp Superfund Site is the location of a former lead-acid battery breaking and secondary lead smelting facility in Granite City, Illinois (Figure 1). Metal refining, fabricating, and associated activities were conducted at the Site since before the turn of the century with secondary lead smelting conducted since 1903. Operations ceased at the site in 1983.

The Site is located almost entirely within the cities of Granite City, Madison, and Venice, in Madison County, Illinois, approximately two miles east of downtown St. Louis, Missouri. The Site has been divided into three principal areas: the Main Industrial Site, the Adjacent Residential Areas (within the cities of Granite City, Madison, and Venice), and the Remote Fill Areas. The Main Industrial Site is approximately 30 acres in size; the Adjacent Residential Areas consist of approximately 500 acres; and the Remote Fill Areas include locations in Eagle Park Acres and Venice Township [Woodward-Clyde Consultants (WWC), 1995].

Lead and cadmium concentrations were observed in surface soils and groundwater at on-site and off-site locations (IEPA, 1983). The off-site locations at which lead concentrations were observed include Eagle Park and Venice Township, south of the site, where hard rubber from battery cases was utilized as fill material and/or paving material by private parties and Venice Township. Construction of a multimedia cap over the former Taracorp pile at the Main Industrial Site was completed by the Site Group in 1999. The Site Group also completed remedial activities to address soil contamination in the residential areas and remote fill areas.

2.2 Regional Hydrogeology

The Granite City area is situated within a bedrock valley cut by the Mississippi River (Bergstrom and Walker, 1956). The preglacial bedrock valley has been filled with Recent Alluvium and glacially derived valley-train materials (collectively referred to as

the valley fill). The valley fill in the Granite City area varies between approximately 80 and 120 feet thick, with the materials thinning to the west towards Chain of Rocks Canal. The river channel at Chain of Rocks, which is west of the Chain of Rocks Canal, is reported to intersect bedrock (Bergstrom and Walker, 1956).

The valley fill includes silts and clays at or near the surface deposited during recession of floodwaters. As is evidenced by Horseshoe Lake, an oxbow type lake, immediately to the east of Granite City, the Mississippi River has migrated over time across the broad bottom lands, which are 6 to 8 miles wide in the Granite City area. The channel migration, the associated cut-and-fill actions, and the flooding have produced complex heterogeneous deposits of varying thickness.

Investigations conducted by the Illinois State Water Survey (Piskin and Bergstrom, 1975) indicate that the sand and sand and gravel deposits below the surficial silts and clays, become coarser with depth. At the base of the valley fill deposits in the Granite City area, 20 to 35 feet of clean sand and gravel are encountered (Bergstrom and Walker, 1956). These deposits become finer to the east and grade into dominantly sand and silt in the Horseshoe Lake area.

Groundwater in the Granite City area occurs in valley fill deposits under water table or leaky artesian conditions, depending upon the extent to which fine- and coarse-grained sediments are interbedded. Locally, portions of the surficial silts and clay may be saturated and would therefore be under water-table conditions. Bedrock while saturated, is generally not considered a significant source of groundwater in the bottomlands area. The bedrock is generally of lower permeability with water being yielded primarily from fractures.

Generally, groundwater flow in the valley fill deposits is from northeast to southwest in the Granite City area. Locally, groundwater pumping and the associated cone of depression will change the regional groundwater flow pattern. From 1978 to 1980, groundwater level monitoring performed by the Illinois State Water Survey (Collins and Richards, 1986) identified a water-table depression on the west side of Granite City, which appears to be associated with a pumping center.

Groundwater under non-pumping conditions is recharged by rainfall and floods. The Mississippi River is a major groundwater discharge area under normal river stage conditions. Under high flow conditions when the river level is higher than the water table, the Mississippi River will serve as a recharge source for the valley fill aquifer. In

situations where high volume pumping is occurring near the river, flow will be from the river toward the pumping center.

The Illinois Water Survey indicates that groundwater usage in the Granite City area is for industrial purposes and that fluctuations in groundwater usage are related to the cyclical nature of the area's steel industry (Collins and Richards, 1986). The local water utility district, which serves Granite City and the adjacent communities of Madison and North Venice, indicates that it uses treated Mississippi River water in the area's distribution systems.

3.0 Groundwater Investigation

In accordance with the Groundwater Monitoring Plan (ARCADIS, 2000c) and remedy selected for the Site, water-level measurements and groundwater samples were collected by ARCADIS on behalf of the Site Group at the monitoring well locations listed in Table 1 and presented in Figures 2 through 8. The 2002 annual groundwater monitoring event was conducted July 22 through July 25, 2002.

3.1 Water Level Measurements

Prior to the initiation of groundwater sampling activities, one round of water-level measurements (total well depth and depth-to-water) was collected over a 20-hour period on July 22 and July 23, 2002 using an electronic water-level indicator. Water-level data for this event are summarized in Table 1 and presented on Figure 9. Historic groundwater elevation data are also included in Table 1. Site data indicate that groundwater in the surficial aquifer flows to the south-southwest.

3.2 Groundwater Sampling

Groundwater samples were collected according to low-flow sampling procedures specified in the Groundwater Monitoring Plan. In accordance with the findings of the September 2000 Pre-Design Investigation Report (ARCADIS, 2000b), samples were collected using a low-flow sampling pump (versus bailer) and were not filtered in the field.

Prior to actual sampling, the stability of field parameters was verified using a flow-through cell. Field measurements included groundwater pH, turbidity, temperature, conductivity, and oxidation-reduction potential (ORP). Field measurements were recorded on Groundwater Sampling Logs, which are presented in Appendix A.

Upon sample collection, containers were labeled, placed in an iced cooler, and submitted to the project laboratory (STL Savannah Laboratories of Savannah, Georgia) for analysis. Groundwater samples were submitted for analysis of the following Target Analyte List (TAL) metals using U.S. EPA Method 6010 (Test Methods for Evaluating Solid Waste, SW-846, Third Edition): cadmium, lead, and zinc. As required by the Groundwater Monitoring Plan, the groundwater samples collected from the 29 wells at the Main Industrial Site were submitted for analysis of select parameters (cadmium, lead, and zinc), while the six (6) samples from monitoring wells in the Remote Fill Areas were submitted for analysis of lead only.

3.3 Monitoring Well Location and Elevation Survey

In order to verify locations and refine vertical control, 24 wells located at the Main Industrial Site were surveyed. The survey was conducted on Thursday, July 25, 2002 by Juneau Associates, of Granite City, Illinois under the supervision of ARCADIS field personnel. The elevation data were collected using a level and the horizontal data were collected using a total station. Horizontal coordinates are based on the NAD 27 datum, and elevations are based on the NGVD 29 datum. Use of this control data (versus the more common NAD 83 and NAVD 88) has allowed coordinates and elevations to be plotted on the existing March 1997 U.S. Army Corps of Engineers topographic survey maps, "Superfund Site, N.L. Industries / Taracorp, Topographic Survey – Area A and Area B."

Prior to field activity, ARCADIS contacted the appropriate property owners in order to obtain the necessary permission to access the monitoring well locations under the existing access agreements. During the survey activity, ARCADIS provided the field oversight to facilitate access to the monitoring wells with the various property owners, locate the individual monitoring wells, and access the monitoring wells to allow for measurement of top-of-casing (north side) and ground elevations.

Upon completion of field activity and receipt of survey data, ARCADIS reviewed the data and applied the location coordinates to the March 1997 U.S. Army Corps of Engineers topographic survey maps of NL Industries "Superfund Site, N.L. Industries / Taracorp, Topographic Survey – Area A and Area B." The data are presented in this report as Table 2.

4.0 Results of Chemical Analyses

Laboratory results for all groundwater samples collected from the NL Industries/Taracorp Site as part of the 2002 annual groundwater monitoring event are summarized in Table 3. For trending and comparison purposes, historic groundwater analytical data (March 2000, April 2000, and December 2001) are also included in Table 3. Copies of the STL Savannah Laboratories analytical data reports for this event are provided in Appendix B. Analytical results for the groundwater samples are reported in milligrams per liter (mg/L).

Laboratory data consist of ARCADIS Level II deliverables as specified by the Groundwater Monitoring Plan. These data were reviewed and validated according to U.S. EPA approved methodologies and data validation guidelines for inorganic parameters, "USEPA National Functional Guidelines for Inorganic Data Review," dated February 1994. The data validation concluded that the data were found to be of acceptable quality and no data qualifications were required. The data validation memorandum for the 2002 groundwater monitoring event is presented in Appendix C.

4.1 Main Industrial Site

The analytical results for all groundwater samples indicate that exceedances of the Illinois groundwater protection standards for the TAL metals at the Main Industrial Site are limited to GMMW-106S and Monitoring Well Nest GMMW-108. The GMMW-108 well nest is located immediately downgradient of the former battery breaker. Concentrations exceeding groundwater protection standards were recorded as follows (reported as mg/L):

| Groundwater Protection Standards | | | | | |
|----------------------------------|---------|----------|-----------|-----------|-----------|
| | Class I | Class II | GMMW-106S | GMMW-108S | GMMW-108D |
| Cadmium | 0.005 | 0.05 | <0.005 | 1.9 | 6 |
| Zinc | 5 | 10 | <0.02 | 11 | 31 |
| Lead | 0.0075 | 0.1 | 0.02 | <0.005 | <0.005 |

The GMMW-108 well nest is located immediately downgradient from the former battery breaker. Findings are consistent with historically reported concentrations.

GMMW-106S is located downgradient of the closed Taracorp pile in the northwest portion of the Main Industrial Site. Historically, GMMW-106S has been a dry well;

the July 2002 sampling event was the first during which the well yielded sufficient volume for sample collection. GMMW-106S was not developed prior to sampling during this event. Though field measurements of turbidity indicate NTU levels within range of the values for the Site monitoring well network, observations recorded on the water sampling logs describe the sample as "brown and cloudy." As such, it is likely that the exceedance of groundwater protection standards for lead is attributed to suspended solids. This finding is also consistent with trends observed during the 2000 Pre-Design Investigation, during which samples were collected as bailer-unfiltered, low-flow filtered, and low-flow-unfiltered. To confirm this assessment of findings at GMMW-106S, ARCADIS recommends that a low-flow-filtered sample be collected at GMMW-106S during the next (Spring 2003) sampling event in addition to the usual low-flow, unfiltered sample.

All analytical results for lead collected from off-site monitoring wells at the Main Industrial Site are below the Illinois groundwater protection standards for Class I and Class II groundwaters of 0.0075 mg/L and 0.1 mg/L, respectively.

4.2 Remote Fill Areas

As required, groundwater samples were also collected from the Remote Fill Areas (Venice Township and Eagle Park Acres) during the 2002 annual monitoring event. The groundwater samples collected from the Remote Fill Areas were submitted for laboratory analysis of TAL metals for total lead. A summary of the groundwater sampling results for the Remote Fill Areas is included in Table 3.

All analytical results for the groundwater samples collected from the Remote Fill Areas were below the Illinois groundwater protection standards for lead.

5.0 Summary of Findings

The following findings can be made based on the field observations and laboratory data obtained during the 2002 annual groundwater monitoring event at the NL Industries/Taracorp Site.

Main Industrial Site

- Historical groundwater elevation data collected during the remedial investigation indicated a south-southwesterly flow direction in the surficial aquifer. Groundwater elevation data collected during the present investigation showed a similar flow pattern.
- Exceedances of the Illinois groundwater protection standards for the TAL metals at the Main Industrial Site are limited to GMMW-106S and Monitoring Well Nest GMMW-108. Findings at GMMW-106S, a historically dry well, are likely attributed to suspended solids.
- Lead was not detected in samples from off-site downgradient wells installed at the Granite City Steel facility (GMMW-115, GMMW-124, and GMMW-125) or from the well installed on Terminal Railroad of St. Louis property (GMMW-116) during this monitoring event, again confirming that lead has not migrated off the Main Industrial Site.

Remote Fill Areas

- Lead was not detected in the groundwater samples collected from wells in Venice Township (GMMW-117, GMMW-118, and GMMW-119) or from wells in Eagle Park Acres (GMMW-120, GMMW-121, and GMMW-122) during this groundwater monitoring event.

Based on these findings, it can again be concluded that the relatively low levels of metals that have been detected in monitoring wells in the former source area at the Main Industrial Site are not mobile in groundwater and have not migrated offsite. This conclusion is based on reproducible analytical results obtained during this recent July 2002 monitoring event, the first annual sampling groundwater sampling event of December 2001 (ARCADIS, 2002), and the two separate groundwater sampling events performed during the 2000 Pre-Design Investigation.

6.0 References

- ARCADIS G&M, Inc. Consultants. 2000a. Pre-Design Investigation Work Plan for Groundwater, NL/Taracorp Superfund Site, Granite City, Illinois, August 25, 2000 (Draft approved October 25, 1999).
- ARCADIS G&M, Inc. Consultants. 2000b. Pre-Design Investigation Report for Groundwater, NL/Taracorp Superfund Site, Granite City, Illinois, September 2000.
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- Piskin, Kemal and Robert E. Bergstrom. 1975. Glacial Drift in Illinois: Thickness and Character. Illinois State Geological Survey Circular 490, 34 pp.
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Woodward-Clyde Consultants. 1993. Supplemental Groundwater Investigation:
Fourth Groundwater Sampling Event, NL/Taracorp Superfund Site, Granite
City, Illinois, November 1993.

Woodward-Clyde Consultants. 1995. Second Addendum to the Feasibility Study,
NL/Taracorp Superfund Site, Granite City, Illinois, February 1995.

TABLES

Table 1. Groundwater Elevation Data,
NL Industries/Taracop Site, Granite City, Illinois.

Notes

¹ Survey conducted by ~~Hilleah~~ Associates of Granite City, Illinois on July 25, 2002.

*Source: "Supplemental Groundwater Investigation" Woodward-Clyde Consultants, November 1993.

Groundwater elevation data presented as NAVD 88 ground elevation and depth to water elevation measurements presented as NAVD

All screen material is Polyvinyl chloride (PVC).
Type A screen material is Schedule 40 PVC with 0.010 inch slot size.
All underwater elevation presents is PVC.

Type A Screen material is Screenline 40 PVC with 0.010 inch slot size.
Type B screen material is Vee-Pak (pre-sand packed) Schedule 40 PVC with 0.008 inch slot size.

0.3 below land surface
NAVD North American Vertical Datum 1988
NA Not Available
NM Not Measured

Table 2. Monitoring Well Location and Elevation Survey Data Results,
NL Industries/Taracorp Site, Granite City, Illinois

| Point Number | Well Designation | NAD '83 | | Top of PVC Casing Elevation | NAVD '88 | |
|-----------------|---------------------|-------------|-------------|-----------------------------------|-----------------------|---|
| | | Latitude | Longitude | | Concrete Elevation | Asphalt/ Gravel/ Ground Elevation |
| 1 | MW-108S | 38.69567506 | 90.15776509 | 422.27 | 420.32 | 419.81 |
| 2 | MW-108X | 38.69571831 | 90.15776559 | 422.55 | 402.63 | 420.09 |
| 3 | MW-104 | 38.69564291 | 90.15861898 | 421.21 | | 419.64 |
| 4 | MW-106S | 38.69814606 | 90.15865196 | 423.58 | | 420.92 |
| 5 | MW-106D | 38.69816140 | 90.15865148 | 423.52 | | 421.00 |
| 6 | MW-107S | 38.69740438 | 90.15864084 | 420.66 | | 419.26 |
| 7 | MW-107D | 38.69738729 | 90.15864007 | 421.57 | | 419.31 |
| 8 | MW-105D | 38.69870901 | 90.15860195 | 428.45 | 425.84 | 425.65 |
| 9 | MW-105S | 38.69872709 | 90.15862475 | 428.46 | | 425.65 |
| 10 | GMWW-116D | 38.69851742 | 90.15911850 | 422.38 | 422.79 | 422.74 |
| 11 | GMWW-116S | 38.69850114 | 90.15911827 | 422.35 | 422.81 | 422.73 |
| 12 | MW-102 | 38.69459286 | 90.15585065 | 416.12 | 413.70 | 413.51 |
| 13 | MW-112D | 38.69448367 | 90.15689461 | 416.46 | 414.53 | 414.11 |
| 14 | MW-112S | 38.69447799 | 90.15687440 | 416.44 | 414.47 | 414.01 |
| 15 | MW-103R | 38.69352463 | 90.15759704 | 417.18 | 415.15 | 414.68 |
| 16 | MW-109X | 38.69374280 | 90.15876330 | 418.47 | 416.52 | 416.23 |
| 17 | MW-109D | 38.69372560 | 90.15876686 | 418.50 | 416.17 | 416.01 |
| 18 | MW-109S | 38.69370868 | 90.15876971 | 418.48 | 416.45 | 416.11 |
| 19 | MW-115S | 38.69407853 | 90.15930374 | 418.44 | 418.85 | 418.79 |
| 20 | MW-115D | 38.69409384 | 90.15930231 | 418.53 | 418.86 | 418.85 |
| 21 | GMWW-124D | 38.69234532 | 90.15945472 | 417.82 | 418.20 | 418.17 |
| 22 | GMWW-124S | 38.69233372 | 90.15946503 | 417.75 | 418.11 | 418.05 |
| 23 | MW-101 | 38.69697848 | 90.15619688 | 421.17 | | 418.65 |
| 24 | GMMW-113S | 38.69393780 | 90.15590557 | 413.60 | 414.03 | 413.98 |
| 25 | GMWW-113D | 38.69396103 | 90.15589839 | 413.47 | 413.85 | 413.83 |

Survey conducted by Juneau Associates, Inc. P.C., of Granite City, Illinois on July 25, 2002.

G:\Aproject\NLIndustries\CI001003.000-\CI001003.0007 2002 GW Monitoring\[Table 2 Survey Data.xls]Survey data

**Table 3. Groundwater Analytical Results,
NL Industries/Taracorp Superfund Site, Granite City, Illinois.**

| Well Designation | Sample Date | Analytical Parameters | | | Well Designation | Sample Date | Analytical Parameters | | | |
|-----------------------------|-------------|-----------------------|--------|-------|-----------------------------|-------------|-----------------------|---------|---------|-------|
| | | Cadmium | Lead | Zinc | | | Cadmium | Lead | Zinc | |
| <i>Groundwater Class I</i> | | 0.005 | 0.0075 | 5 | <i>Groundwater Class I</i> | | 0.005 | 0.0075 | 5 | |
| <i>Groundwater Class II</i> | | 0.05 | 0.1 | 10 | <i>Groundwater Class II</i> | | 0.05 | 0.1 | 10 | |
| MW-101 | 03/22/00 | <0.005 | 0.0056 | <0.02 | MW-113S | 03/22/00 | <0.005 | <0.005 | <0.02 | |
| | 04/11/00 | <0.005 | <0.005 | <0.02 | | 04/11/00 | <0.005 | <0.005 | <0.02 | |
| | 04/11/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 | |
| | 12/11/01 | <0.005 | <0.005 | <0.02 | | 07/24/02 | <0.005 | <0.005 | <0.02 | |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | MW-113D | 03/22/00 | <0.005 | <0.005 | <0.02 |
| MW-102 | 03/22/00 | <0.005 | 0.0076 | <0.02 | | 04/12/00 | <0.005 | <0.005 | <0.02 | |
| | 04/11/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 | |
| | 12/11/01 | <0.005 | <0.005 | <0.02 | | 07/24/02 | <0.005 | <0.005 | <0.02 | |
| | 07/24/02 | <0.005 | <0.005 | <0.02 | MW-115S | 05/22/00 | <0.0050 | <0.0050 | NA | |
| MW-103R | 03/20/00 | <0.005 | <0.005 | <0.02 | | 07/26/00 | <0.0050 | <0.0050 | <0.020 | |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 | |
| | 12/11/01 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 | |
| | 07/24/02 | <0.005 | <0.005 | <0.02 | MW-115D | 07/26/00 | <0.0050 | <0.0050 | <0.020 | |
| MW-104 | 03/22/00 | <0.005 | 0.025 | 0.028 | | 12/11/01 | <0.005 | <0.005 | <0.02 | |
| | 04/12/00 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 | |
| | 12/13/01 | <0.005 | <0.005 | <0.02 | | MW-116S | 05/22/00 | <0.0050 | <0.0050 | NA |
| | 07/24/02 | <0.005 | <0.005 | <0.02 | | 07/26/00 | <0.0050 | <0.0050 | <0.020 | |
| MW-105D | 03/21/00 | <0.005 | 0.09 | 0.024 | | 12/13/01 | <0.005 | <0.005 | <0.02 | |
| | 04/11/00 | <0.005 | 0.0051 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 | |
| | 12/13/01 | <0.005 | <0.005 | <0.02 | MW-116D | 05/22/00 | <0.0050 | <0.0050 | NA | |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 07/26/00 | <0.0050 | <0.0050 | <0.020 | |
| MW-105S | 07/25/02 | <0.005 | <0.005 | <0.02 | | 12/13/01 | <0.005 | <0.005 | <0.02 | |
| | | | | | | 07/23/02 | <0.005 | <0.005 | <0.02 | |
| | | | | | MW-117 | 03/23/00 | NA | <0.005 | <0.02 | |
| | | | | | | 04/12/00 | NA | <0.005 | NA | |
| MW-106D | 03/21/00 | <0.005 | <0.005 | <0.02 | | 12/12/01 | NA | <0.005 | NA | |
| | 04/11/00 | <0.005 | <0.005 | <0.02 | | 07/24/02 | NA | <0.005 | NA | |
| | 12/13/01 | <0.005 | <0.005 | <0.02 | | MW-118 | 03/23/00 | NA | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 04/12/00 | NA | <0.005 | NA | |
| MW-106S | 07/25/02 | <0.005 | 0.02 | <0.02 | | 12/12/01 | NA | <0.005 | NA | |
| | | | | | | 07/24/02 | NA | <0.005 | NA | |
| | | | | | MW-119 | 03/23/00 | NA | <0.005 | <0.02 | |
| | | | | | | 04/12/00 | NA | <0.005 | NA | |
| MW-107S | 03/22/00 | <0.005 | 0.0085 | 0.03 | | 12/12/01 | NA | <0.005 | NA | |
| | 04/11/00 | <0.005 | <0.005 | <0.02 | | 07/24/02 | NA | <0.005 | NA | |
| | 12/13/01 | <0.005 | <0.005 | <0.02 | | MW-120 | 03/23/00 | NA | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 04/12/00 | NA | <0.005 | NA | |
| MW-107D | 03/22/00 | <0.005 | 0.041 | 0.056 | | 12/12/01 | NA | <0.005 | NA | |
| | 04/11/00 | <0.005 | 0.03 | 0.17 | | 07/24/02 | NA | <0.005 | NA | |
| | 12/13/01 | <0.005 | <0.005 | <0.02 | | MW-121 | 03/23/00 | NA | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 04/12/00 | NA | <0.005 | NA | |
| MW-108S | 03/21/00 | 4.3 | <0.005 | 21 | | 12/12/01 | NA | <0.005 | NA | |
| | 04/11/00 | 4.7 | <0.005 | 27 | | 07/24/02 | NA | <0.005 | NA | |
| | 12/12/01 | 2.3 | <0.005 | 14 | | MW-120 | 03/23/00 | NA | <0.005 | NA |
| | 07/25/02 | 1.9 | <0.005 | 11 | | 04/12/00 | NA | <0.005 | NA | |
| MW-108D | 03/21/00 | 6.4 | 0.0069 | 35 | | 12/12/01 | NA | <0.005 | NA | |
| | 04/11/00 | 6.1 | <0.01 | 35 | | 07/24/02 | NA | <0.005 | NA | |
| | 12/12/01 | 6.9 | <0.01 | 32 | | MW-121 | 03/23/00 | NA | <0.005 | NA |
| | 07/25/02 | 6 | <0.01 | 31 | | 04/12/00 | NA | <0.005 | NA | |

Table 3. Groundwater Analytical Results,
NL Industries/Taracorp Superfund Site, Granite City, Illinois.

| Well Designation | Sample Date | Analytical Parameters | | | Well Designation | Sample Date | Analytical Parameters | | |
|------------------|-------------|-----------------------|----------|-------|------------------|-------------|-----------------------|---------|--------|
| | | Cadmium | Lead | Zinc | | | Cadmium | Lead | Zinc |
| MW-108X | 03/21/00 | <0.005 | <0.005 J | <0.02 | MW-122 | 03/23/00 | NA | <0.005 | <0.02 |
| | 03/21/00 | 0.0059 | 0.02 J | 0.06 | | 04/12/00 | NA | <0.005 | NA |
| | 04/11/00 | 0.01 | 0.014 | 0.065 | | 12/12/01 | NA | <0.005 | NA |
| | 12/12/01 | <0.005 | <0.005 | 0.047 | | 07/24/02 | NA | <0.005 | NA |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 03/22/00 | <0.005 | <0.005 | <0.02 |
| MW-109S | 03/21/00 | <0.005 | <0.005 | <0.02 | MW-123 | 04/12/00 | <0.005 | <0.005 | <0.02 |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 |
| | 12/10/01 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 05/22/00 | <0.0050 | <0.0050 | NA |
| MW-109D | 03/21/00 | <0.005 | <0.005 | <0.02 | MW-124S | 07/26/00 | <0.0050 | <0.0050 | <0.020 |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 |
| | 12/10/01 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 05/22/00 | <0.0050 | <0.0050 | NA |
| MW-109X | 03/21/00 | <0.005 | 0.013 | 0.042 | MW-124D | 05/22/00 | <0.0050 | <0.0050 | NA |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 07/26/00 | <0.0050 | <0.0050 | <0.020 |
| | 12/10/01 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 |
| MW-112S | 03/20/00 | <0.005 | <0.005 | <0.02 | MW-125 | 05/22/00 | <0.0050 | <0.0050 | NA |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 07/26/00 | <0.0050 | <0.0050 | <0.020 |
| | 12/10/01 | <0.005 | <0.005 | <0.02 | | 12/13/01 | <0.005 | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | 07/23/02 | <0.005 | <0.005 | <0.02 |
| MW-112D | 03/20/00 | <0.005 | <0.005 | <0.02 | MW-126 | 07/26/00 | <0.0050 | <0.0050 | <0.020 |
| | 04/10/00 | <0.005 | <0.005 | <0.02 | | 12/11/01 | <0.005 | <0.005 | <0.02 |
| | 12/10/01 | <0.005 | <0.005 | <0.02 | | 07/24/02 | <0.005 | <0.005 | <0.02 |
| | 07/25/02 | <0.005 | <0.005 | <0.02 | | | | | |

Results are reported in milligrams per liter (mg/L).

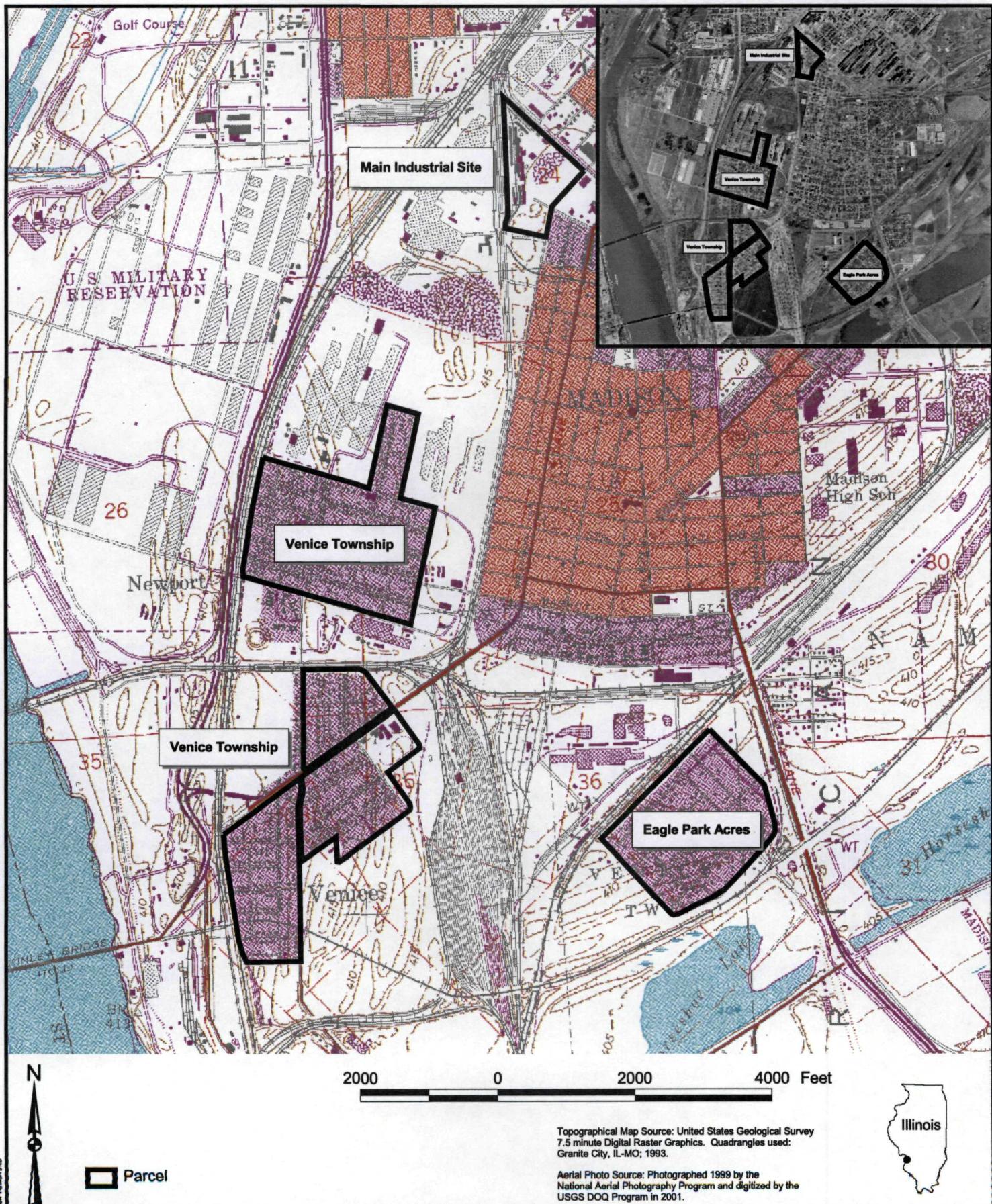
Sample collected using low-flow unfiltered methodology.

NA Not analyzed.

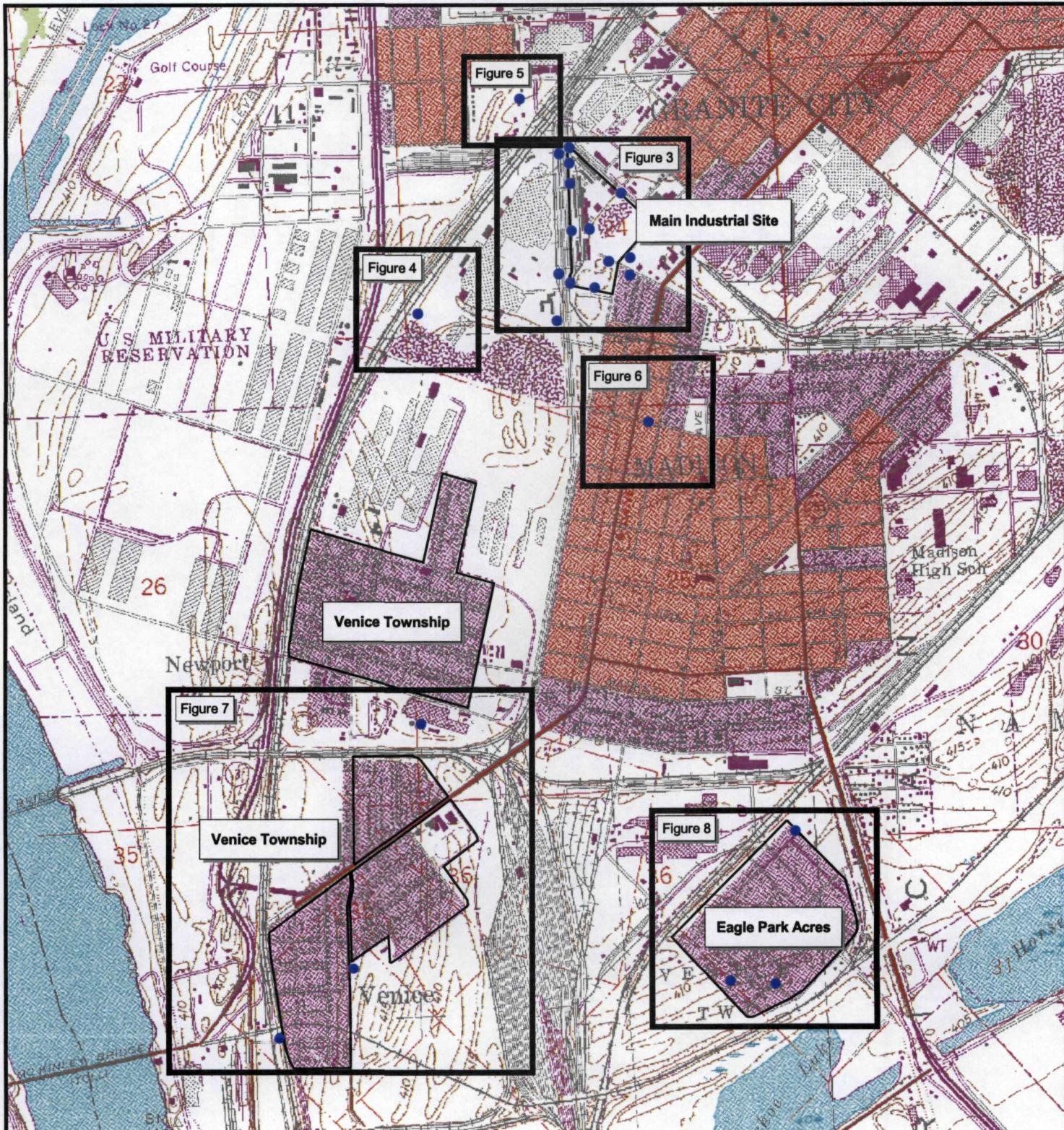
Exceeds Class I

Exceeds Class II

FIGURES



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|---------------------------------------|------------|---------------------------------|-------------|-------------|----------------------------------|
| 09/04/2002 | nl.apr | G:\GIS\Mapping\NLIC001003.0007\ | M. Eiserman | K. Lala | J. Kratzmeyer |
| NL Industries/Taracorp Superfund Site | | | | | View: Site Location Map |
| Site Location Map | | | | | Figure: 1 |
| Granite City, Illinois | | | | | Project Number: CI001003.0007 |

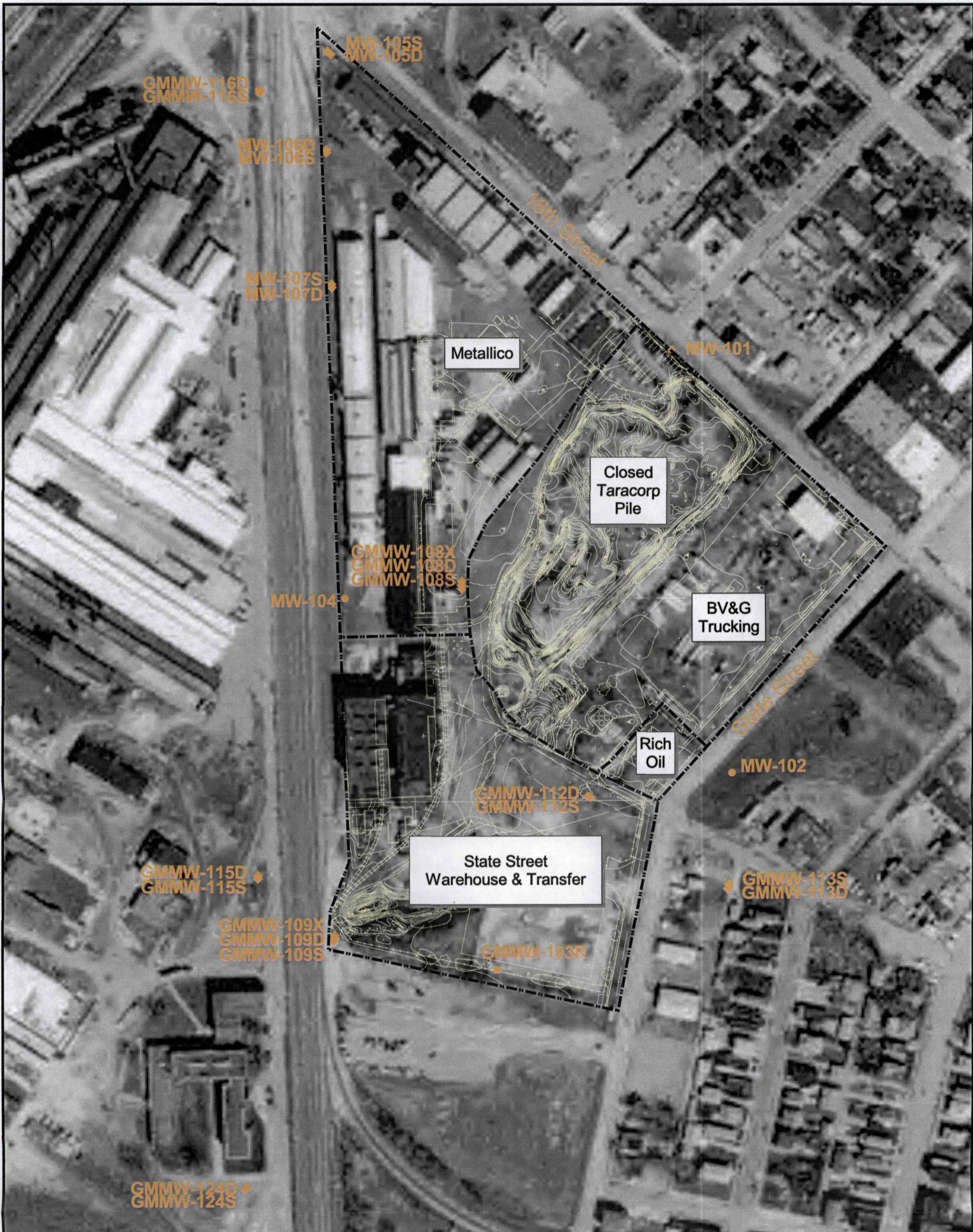


2000 0 2000 4000 Feet

- Wells
- Parcel Boundary

Topographical Map Source: United States Geological Survey
7.5 minute Digital Raster Graphics. Quadrangles used:
Granite City, IL-MO; 1993.

| | | | | | |
|---------------------------------------|---------------------------|----------------------------------|------------|-------------|------------------|
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| 09/05/2002 | nl.apr | G:\GIS\Mapping\NL\CI001003.0007\ | M. Eiseman | K. Lala | J. Kratzmeyer |
| NL Industries/Taracorp Superfund Site | | | | | |
| Monitoring Well | | | | | |
| Location Index | | | | | |
| Granite City, Illinois | | | | | |
| Dept. Manager: | View: Well Location Index | | | | |
| Project Number: | Figure: CI001003.0007 | | | | |
| | 2 | | | | |



Legend

- MW-101 Existing Monitoring Well/Identification
- GMMW-109S,D Monitoring Well Cluster/Identification(Shallow and Deep Depths)
- GMMW-109X Deeper Monitoring Well/Identification
- GMMW-103R Replacement Monitoring Well/Identification
- S Shallow (12-34 feet below land surface)
- D Deep (27-44 feet below land surface)
- X Deeper (40-50 feet below land surface)
- -- - Approximate Property Line
- Corps of Engineers map

Aerial Photo Source: Photographed 1999 by the National Aerial Photography Program and digitized by the USGS DOQ Program on 2001.

NOTE: Location of GMMW-108D is approximated.
Monitoring well locations surveyed by Juneau Associates, Inc., P.C., on July 25, 2002

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| NL Industries/Taracorp Superfund Site | | | | | Dept. Manager: View: Well Locations, Main Industrial |
| Monitoring Well Locations | | | | | Project Number: CI001003.0007 |
| Main Industrial Site | | | | | Figure: 3 |
| Granite City, Illinois | | | | | |



Legend

- MW-101 Existing Monitoring Well/Identification
- GMMW-109S,D Monitoring Well Cluster/Identification(Shallow and Deep Depths)
- GMMW-109X Deeper Monitoring Well/Identification
- GMMW-103R Replacement Monitoring Well/Identification
- S Shallow (12-34 feet below land surface)
- D Deep (27-44 feet below land surface)
- X Deeper (40-50 feet below land surface)
- - - - - Approximate Property Line
- — — — — Corps of Engineers map

200 0 200 400 Feet

Aerial Photo Source: Photographed 1999 by the
National Aerial Photography Program and digitized by the
USGS DOQ Program in 2001.

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|---------------------------------------|------------|----------------------------------|------------|-------------|------------------------------------|
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| 09/05/2002 | nl.apr | G:\GIS\Mapping\NL\CI001003.00071 | M. Eiseman | K. Lala | J. Kratzmeyer |
| NL Industries/Taracorp Superfund Site | | | | | Dept. Manager: |
| Monitoring Well Location GMMW-125 | | | | | View: Well Location GMMW-125 |
| Main Industrial Site | | | | | Project Number: CI001003.0007 |
| Granite City, Illinois | | | | | Figure: 4 |

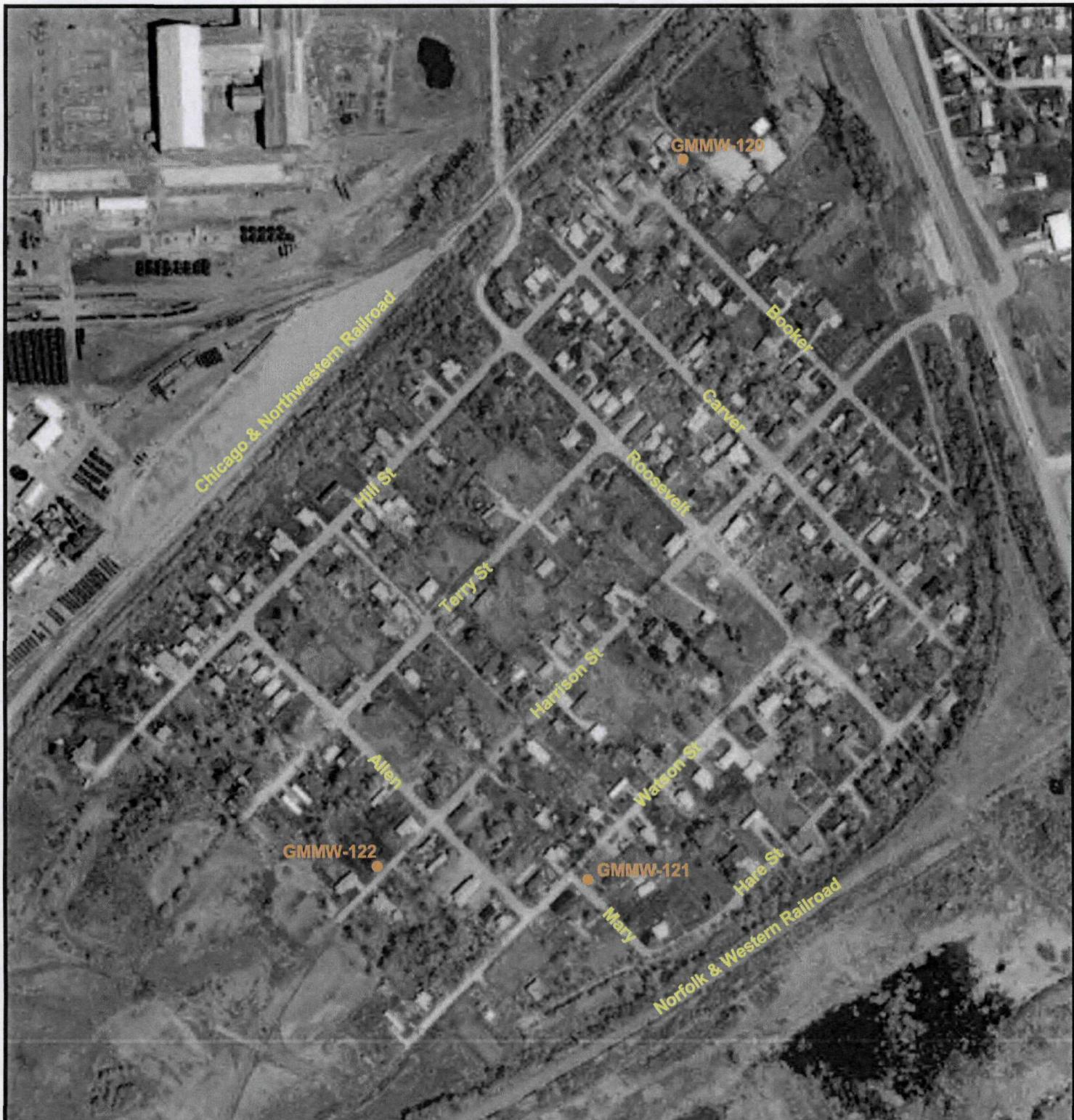


Legend
MW-101 Existing Monitoring Well/Identification
GMMW-109S,D Monitoring Well Cluster/Identification(Shallow and Deep Depths)
GMMW-109X Deeper Monitoring Well/Identification
GMMW-103R Replacement Monitoring Well/Identification
S Shallow (12-34 feet below land surface)
D Deep (27-44 feet below land surface)
X Deeper (40-50 feet below land surface)
--- Approximate Property Line
— Corps of Engineers map

200 0 200 400 Feet

Aerial Photo Source: Photographed 1999 by the
National Aerial Photography Program and digitized by the
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| | | | | | |
|--|------------------------------------|---|-------------------------|------------------------|-----------------------------------|
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| NL Industries/Taracorp Superfund Site Monitoring Well Location GMMW-126 Main Industrial Site Granite City, Illinois | | | | | |
| | | | | | |
| Dept. Manager: | View: Well Location GMMW-126 | Project Number: CI001003.0007 | Figure: 5 | | |



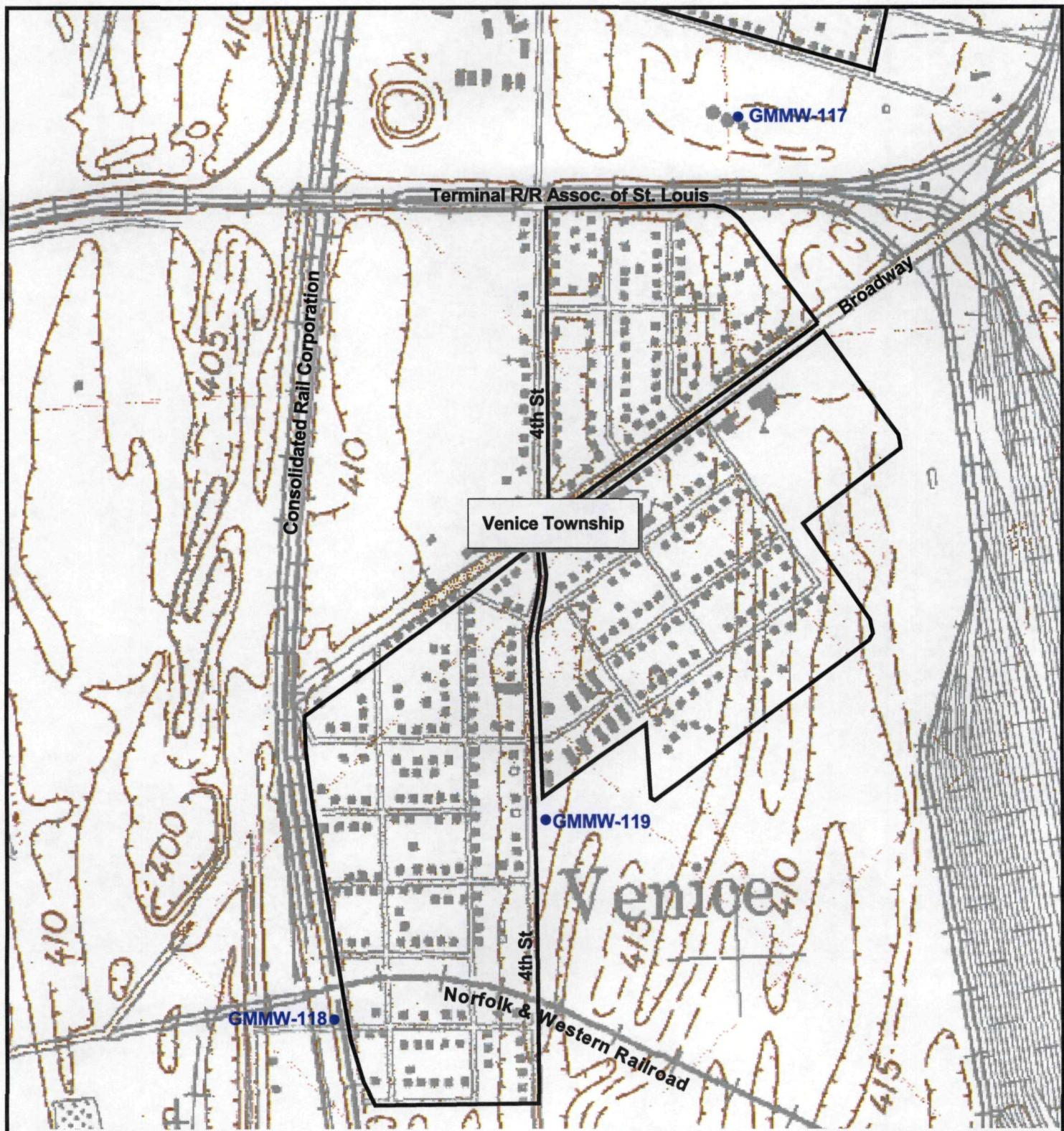
N

Legend

- MW-01 ● Existing Monitoring Well/Identification
- GMMW-109S,D □ Monitoring Well Cluster/Identification(Shallow and Deep Depths)
- GMMW-109X ▲ Deeper Monitoring Well/Identification
- GMMW-103R ■ Replacement Monitoring Well/Identification
- S Shallow (12-34 feet below land surface)
- D Deep (27-44 feet below land surface)
- X Deeper (40-50 feet below land surface)
- Approximate Property Line
- Corps of Engineers map

400 0 400 800 Feet

Aerial Photo Source: Photographed 1999 by the National Aerial Photography Program and digitized by the USGS DOQ Program in 2001.



Legend

- MW-101 • Existing Monitoring Well/Identification
- GMMW-109S,D ♦ Monitoring Well Cluster/Identification(Shallow and Deep Depths)
- GMMW-109X ♦ Deeper Monitoring Well/Identification
- GMMW-103R ■ Replacement Monitoring Well/Identification
- S Shallow (12-34 feet below land surface)
- D Deep (27-44 feet below land surface)
- X Deeper (40-50 feet below land surface)
- - - Approximate Property Line
- - - Corps of Engineers map

Topographical Map Source: United States Geological Survey
7.5 minute Digital Raster Graphics. Quadrangles used:
Granite City, IL-MO; 1993.

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| NL Industries/Taracorp Superfund Site | | | | | |
| Monitoring Well Locations, Remote Fill Areas | | | | | |
| Venice Township | | | | | |
| Granite City, Illinois | | | | | |
| Dept. Manager: | View: Well Location Venice Township | | Project Number: | Figure: CI001003.0007 | |
| | | | | 7 | |

**Legend**

- MW-101 ● Existing Monitoring Well/Identification
- GMMW-109S,D ◻ Monitoring Well Cluster/Identification(Shallow and Deep Depths)
- GMMW-109X ◇ Deeper Monitoring Well/Identification
- GMMW-103R ■ Replacement Monitoring Well/Identification
- S Shallow (12-34 feet below land surface)
- D Deep (27-44 feet below land surface)
- X Deeper (40-50 feet below land surface)
- - - Approximate Property Line
- - - Corps of Engineers map

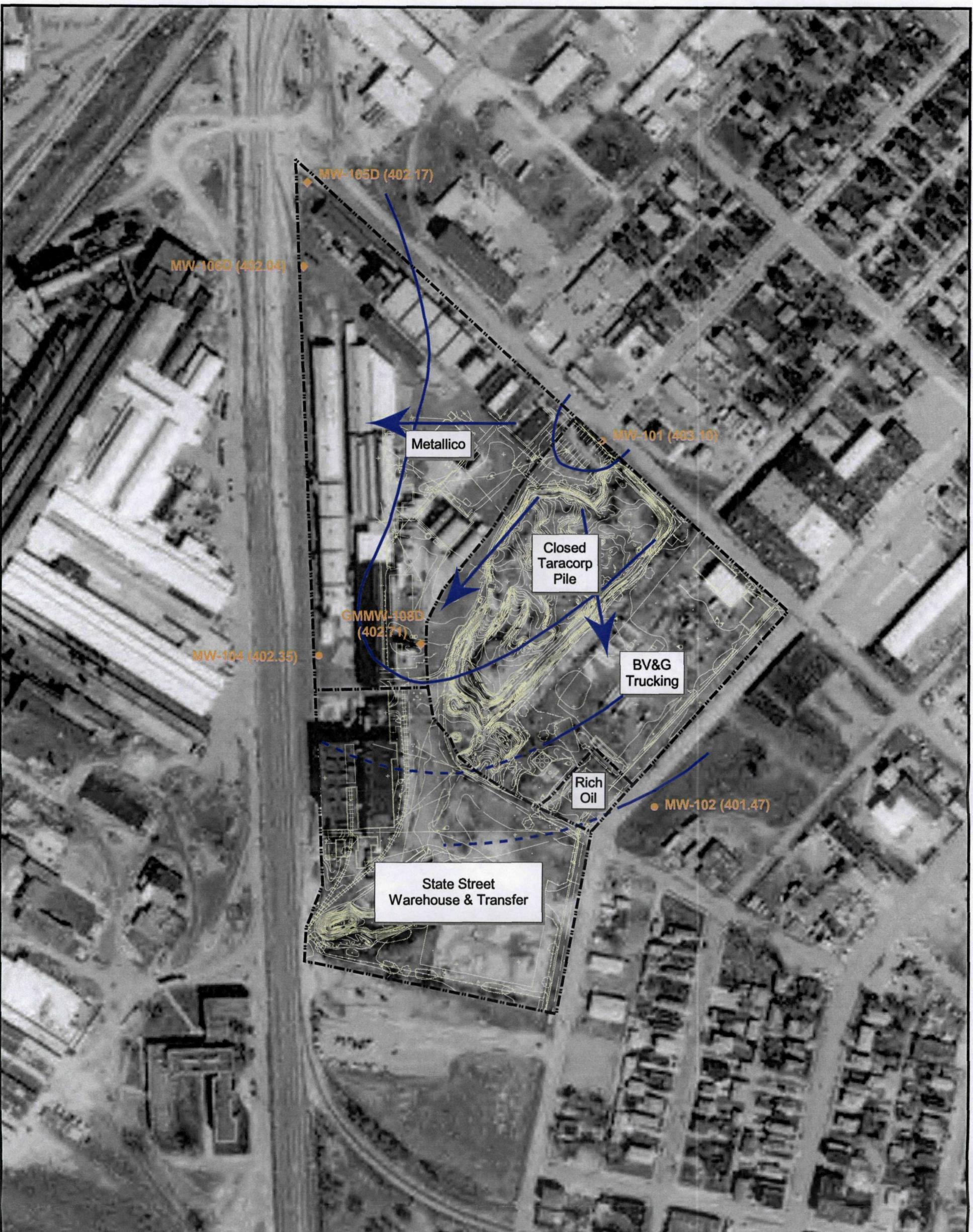
200 0 200 400 Feet

Aerial Photo Source: Photographed 1999 by the
National Aerial Photography Program and digitized by the
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| 09/05/2002 | nl.apr | G:\GIS\Mapping\NL\CI001003.0007 | M. Eiseman | K. Laia | J. Kratzmeyer |
| NL Industries/Taracorp Superfund Site | | | | | |
| Monitoring Well Location GMMW-123 | | | | | |
| National Steel Corp | | | Dept. Manager: | | |
| Granite City, Illinois | | | View: Well Location Nat. Steel Corp. | | |
| CI001003.0007 | | | Project Number: | | |
| Figure: 8 | | | | | |



MW-101 ● Existing Monitoring Well/Identification
 GMMW-109S,D ▲ Monitoring Well Cluster/Identification(Shallow and Deep Depths)
 GMMW-109X △ Deeper Monitoring Well/Identification
 GMMW-103R ■ Replacement Monitoring Well/Identification
 S Shallow (12-34 feet below land surface)
 D Deep (27-44 feet below land surface)
 X Deeper (40-50 feet below land surface)
 Groundwater Elevation (in feet)
 (401.47) Groundwater Contour (Dashed where inferred)
 401.00 Groundwater Flow Direction
 - - - - - Approximate Property Line
 - - - - - Corps of Engineers map

200 0 200 400 Feet

N
Archivew Version 3.2b

NOTE: Location of GMMW-108D is approximated.
 Monitoring well locations surveyed by Juneau Associates, Inc. P.C. on July 25, 2002

Topographical Map Source: United States Geological Survey
 7.5 minute Digital Raster Graphics. Quadrangles used:
 Granite City, IL-MO; 1993.



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|---|----------------------|---------------------------------|------------|-------------|------------------|
| 09/05/2002 | nl.apr | G:\GISMapping\NL\CI001003.0007\ | M. Eiseman | K. Lala | J. Kratzmeyer |
| NL Industries/Taracorp Superfund Site Groundwater Elevation and Contours | | | | | |
| July 22, 2002 Main Industrial Site Granite City, Illinois | | | | | |
| Dept. Manager: | View: | | | | |
| | Groundwater Contours | | | | |
| Project Number: | Figure: | | | | |
| CI001003.0007 | 9 | | | | |

ARCADIS

Appendix A

Groundwater Sampling Logs

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-101 | Date | 7/25/2002 |
| Screen Setting | 15.0-25.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 17.95 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 26.09 | Pump On: | 15:39:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 16:07:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 16:07:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburgs |

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|------------------------------|
| Project/No. | CI001003.0007.00001 | Well | MW-102 | Date | 7/24/2002 |
| Screen Setting | 15.0-25.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 15.16 | Measured Width | | Well Materials | X PVC ST. Steel |
| Total depth (ft btoc) | 24.09 | Pump On: | 16:54:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 17:25:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 17:25:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|-----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | GMMW-103R | Date | 7/24/2002 |
| Screen Setting | 13.0-23.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 15.78 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 25.58 | Pump On: | 17:39:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 18:10:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 18:10:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-104 | Date | 7/24/2002 |
| Screen Setting | 17.0-27.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 19.93 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (Ft btoc) | 28.8 | Pump On: | 14:48:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 15:18:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 15:18:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburgs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-105S | Date | 7/25/2002 |
| Screen Setting | 21.0-26.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 26.66 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 28.64 | Pump On: | 9:55:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 10:22:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 10:22:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburgs |

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Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-106S | Date | 7/25/2002 |
| Screen Setting | 15.79-20.79 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 21.87 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 22.39 | Pump On: | 11:08:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 11:43:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 11:43:00 | Sampled By: | E. Moosbrugger, K. Peterburgs |
| Other | Peristaltic | Bailer Type: | | | |

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Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-106D | Date | 7/25/2002 |
| Screen Setting | 29.91-34.91 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 21.81 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 37.44 | Pump On: | 10:35:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 11:00:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 11:00:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburgs |

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Groundwater Sampling Form

Page 1 of 1

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|-------------------------|---------------------|-----------------------------|----------|-------------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | MW-107S | Date | 7/25/2002 |
| Screen Setting | 17.46-22.46 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 14.09 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 23.84 | Pump On: | 11:53:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 12:27:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 12:27:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburgs | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-108S | Date | 7/25/2002 |
| Screen Setting | 19.0-29.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 20.59 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 31.36 | Pump On: | 15:05:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 15:26:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 15:26:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Mossbrugger, K. Peteburs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | C1001003.0007.00001 | Well | MW-108D | Date | 7/25/2002 |
| Screen Setting | 27.26-32.26 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 20.02 | Measured Width | | Well Materials | X PVC ST. Steel |
| Total depth (ft btoc) | 33.66 | Pump On: | 14:25:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 14:50:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 14:50:00 | Sampled By: | E. Moosbrugger, K. Peterburg |
| Other | Peristaltic | Bailer Type: | | | |

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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| Project/No. | <u>CI001003.0007.00001</u> | Well | <u>GMMW-108X</u> | Date | <u>7/25/2002</u> | | |
| Screen Setting | <u>40.0-50.0</u> | Measuring Point Description | | | | Casing Diameter (inches) | <u>2</u> |
| Static Level (ft btoc) | <u>21.12</u> | Measured Width | | | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | <u>33.66</u> | Pump On: | <u>13:35:00</u> | Pump Intake: | | | |
| Purge Method | | Pump Off: | <u>14:19:00</u> | Volumes Purged: | | | |
| Centrifugal Submersible | | Sample Time: | <u>14:19:00</u> | Sampled | | | |
| Other | Peristaltic | Bailer Type: | | | | By: | <u>E. Moosbrugger, K. Peterburs</u> |

| Time | Minutes Elapsed | Rate (gpm) (ML) | DTW | Gallons Purged | pH | Cond. ms/cm | TURB (NTUs) | Redox (mV) | Diss. O ₂ (mg/L) | TEMP. (C) | REMARKS 3) |
|-------|-----------------|-----------------|-------|----------------|------|-------------|-------------|------------|-----------------------------|-----------|-------------------|
| 13:43 | 0:08 | | | | | | | | | | No readings taken |
| 13:48 | 0:13 | | 21.12 | | 8.31 | 1.51 | 61.7 | 158 | 6.92 | 24.63 | |
| 13:53 | 0:18 | | 21.12 | | 8.78 | 1.51 | 100 | 136 | 5.63 | 22.22 | |
| 13:58 | 0:23 | | 21.12 | | 8.65 | 1.47 | 206 | 128 | 4.89 | 21.86 | |
| 14:03 | 0:28 | | 21.12 | | 6.80 | 1.43 | 180 | -106 | 2.09 | 21.85 | |
| 14:10 | 0:35 | | 21.12 | | 6.60 | 1.41 | 180 | -113 | 0.32 | 22.21 | |
| 14:13 | 0:38 | | 21.12 | | 6.57 | 1.41 | 140 | -115 | 0.24 | 22.24 | |
| 14:17 | 0:42 | | 21.12 | 2 | 6.57 | 1.41 | 162 | -116 | 0.16 | 21.72 | |
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ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|-----------|-------------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | GMMW-112S | Date | 7/25/2002 |
| Screen Setting | 11.0-21.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 15.25 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 23.11 | Pump On: | 8:46:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 9:07:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 9:07:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburgs | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
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| Project/No. | CI001003.0007.00001 | Well | GMMW-113S | Date | 7/24/2002 |
| Screen Setting | 12.0-22.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 12.54 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 21.46 | Pump On: | 16:15:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 16:40:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 16:40:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburgs | |

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-113D | Date | 7/24/2002 |
| Screen Setting | 27.5-37.5 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 12.42 | Measured Width | | Well Materials | X PVC ST. Steel |
| Total depth (ft btoc) | 36.93 | Pump On: | 15:32:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 16:07:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 16:07:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-1155 | Date | 7/23/2002 |
| Screen Setting | 18.0-28.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 16.82 | Measured Width | | Well Materials | X PVC ST. Steel |
| Total depth (ft btoc) | 27.45 | Pump On: | 13:56:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 14:26:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 14:25:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburgs | |

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-115D | Date | 7/23/2002 |
| Screen Setting | 31.0-41.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 16.91 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 39.88 | Pump On: | 13:09:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 13:44:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 13:44:00 | Sampled By: | E. Moosbrugger, K. Peterburs |
| Other | Peristaltic | Bailer Type: | | | |

| Time | Minutes Elapsed | Rate (gpm) (ML) | DTW | Gallons Purged | pH | Cond. ms/cm | TURB (NTUs) | Redox (mV) | Diss. O2 (mg/L) | TEMP. (C) | REMARKS 3) |
|-------|-----------------|-----------------|-------|----------------|------|-------------|-------------|------------|-----------------|-----------|--------------|
| 13:12 | 0:03 | | 16.91 | | 6.75 | 0.95 | 142 | 220 | 4.33 | 19.62 | |
| 13:17 | 0:08 | | 16.91 | | 6.75 | 0.93 | 169 | 207 | 0.22 | 18.83 | |
| 13:22 | 0:13 | | 16.91 | | 6.75 | 0.93 | 149 | 206 | 0.15 | 18.80 | |
| 13:27 | 0:18 | | 16.91 | | 6.75 | 0.92 | 122 | 202 | 0.06 | 19.02 | |
| 13:32 | 0:23 | | 16.91 | | 6.76 | 0.91 | 197 | 200 | 0.01 | 19.08 | |
| 13:37 | 0:28 | | 16.91 | | 6.77 | 0.91 | 202 | 198 | 0.01 | 19.05 | |
| 13:42 | 0:33 | | 16.91 | 2.5 | 6.77 | 0.45 | 185 | 194 | 0.00 | 18.94 | |
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ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-116S | Date | 7/23/2002 |
| Screen Setting | 21.0-31.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 20.48 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 30.51 | Pump On: | 15:36:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 16:14:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 16:13:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburs | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-116D | Date | 7/23/2002 |
| Screen Setting | 34.0-44.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 20.52 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 42.57 | Pump On: | 14:45:00 | Pump intake: | |
| Purge Method | | Pump Off: | 15:26:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 15:25:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburs |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-117 | Date | 7/24/2002 |
| Screen Setting | 14.0-24.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 13.70 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 23.51 | Pump On: | 12:06:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 12:28:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 12:28:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbruger, K. Peterburgs | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-118 | Date | 7/24/2002 |
| Screen Setting | 24.0-34.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 21.48 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 33.43 | Pump On: | 11:20:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 11:42:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 11:42:00 | Sampled By: | |
| Other | Peristaltic | Bailer Type: | | E. Moosbrugger, K. Peterburg | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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| Project/No. | CI001003.0007.00001 | Well | GMMW-120 | Date | 7/24/2002 |
| Screen Setting | 11.0-21.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 9.42 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 20.51 | Pump On: | 7:51:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 8:29:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 8:28:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburs |

ARCADIS G&M

Groundwater Sampling Form

Page 1 of 1

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|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | GMMW-121 | Date | 7/24/2002 |
| Screen Setting | 10.0-20.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 11.98 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 19.59 | Pump On: | 9:29:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 9:59:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 9:58:00 | Sampled By: | E. Moosbrugger, K. Peterburgs |
| Other | Peristaltic | Bailer Type: | | | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|---|
| Project/No. | CI001003.0007.00001 | Well | GMMW-123 | Date | 7/23/2002 |
| Screen Setting | 12.0-22.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 10.03 | Measured Width | | Well Materials | <input checked="" type="checkbox"/> PVC <input type="checkbox"/> ST. Steel |
| Total depth (ft btoc) | 21.6 | Pump On: | 16:35:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 17:16:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 17:15:00 | Sampled By: | E. Moosbrugger, K. Peterburs |
| Other | Peristaltic | Bailer Type: | | | |

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|-----------|--------------------------|------------------------------|
| Project/No. | CI001003.0007.00001 | Well | GMMW-124D | Date | 7/23/2002 |
| Screen Setting | 30.0-40.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 16.18 | Measured Width | | Well Materials | PVC ST. Steel |
| Total depth (ft btoc) | 39.56 | Pump On: | 11:45:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 12:27:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 12:27:00 | Sampled By: | E. Moosbrugger, K. Peterburg |
| Other | Peristaltic | Bailer Type: | | | |

ARCADIS
Groundwater Sampling Form

Page 1 of 1

ARCADIS G&M
Groundwater Sampling Form

Page 1 of 1

| | | | | | |
|-------------------------|---------------------|-----------------------------|----------|--------------------------|-------------------------------|
| Project/No. | CI001003.0007.00001 | Well | GMMW-126 | Date | 7/24/2002 |
| Screen Setting | 16.0-26.0 | Measuring Point Description | | Casing Diameter (inches) | 2 |
| Static Level (ft btoc) | 14.16 | Measured Width | | Well Materials | X PVC ST. Steel |
| Total depth (ft btoc) | 25.51 | Pump On: | 13:36:00 | Pump Intake: | |
| Purge Method | | Pump Off: | 14:21:00 | Volumes Purged | |
| Centrifugal Submersible | | Sample Time: | 14:21:00 | Sampled | |
| Other | Peristaltic | Bailer Type: | | By: | E. Moosbrugger, K. Peterburgs |

ARCADIS

Appendix B

Laboratory Data Reports

PREPARED FOR:

aweimerskirk@stl-inc.com

Ange Weimerskirk

FILES AUTOMATICALLY BATCHED:

3_S245247_LCS_Report_08-07-2002_1055.DOC
2_S245247_One_Samp-PDF_08-07-2002_1055.DOC

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*1
Sample ID : GMMW-123 (7/23/02)
Matrix : LI Sample
Percent Solids : Received

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*2
Sample ID : GMMW-116S-DUP (7/23/02)
Matrix : LI
Percent Solids :

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*3
Sample ID : GMMW-116S (7/23/02)
Matrix : LI
Percent Solids : Re

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL_Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*4
Sample ID : GMMW-116D (7/23/02)
Matrix : LI Sample
Percent Solids : Recei

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*5
Sample ID : GMMW-115S (7/23/02)
Matrix : LI
Percent Solids :

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*6
Sample ID : GMMW-115D (7/23/02)
Matrix : LI
Percent Solids : Re

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*7
Sample ID : GMMW-124S (7/23/02)
Matrix : LI
Percent Solids :
Sample Received:

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*8
Sample ID : GMMW-124D (7/23/02)
Matrix : LI
Percent Solids :

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

**SEVERN
TRENT
SERVICES**

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*9
Sample ID : GMMW-125 (7/23/02)
Matrix : LI
Percent Solids :

Sampled : 07-23-2002
Received: 07-24-2002

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

SEVERN
TRENT
SERVICES

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.

Work Order ID : NL Industries

Laboratory ID : S245247*10

Sample ID : Method Blank

Matrix : LI

Sampled :

Percent Solids : Received:

RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Prep Date | Analysis Date | Analyst | Result | Qual | Units | DF | RL | MDL |
|-----------|--------|-------|-----------|---------------|---------|--------|------|-------|----|--------|---------|
| Lead | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.0015 |
| Zinc | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.020 | < | mg/l | 1 | 0.020 | 0.0059 |
| Cadmium | 6010 | 0729J | 07-29-02 | 07-30-02 | BB | 0.0050 | < | mg/l | 1 | 0.0050 | 0.00071 |

SEVERN
TRENT
SERVICES

STL Savannah

Client : ARCADIS Geraghty & Miller, Inc.
Work Order ID : NL Industries
Laboratory ID : S245247*11
Sample ID : Lab Control Standard Result
Matrix : LI
Percent Solids :

Sampled :
Received:

LCS RESULTS SUMMARY REPORT

| Parameter | Method | Batch | Spike Result | Expected Value | Units | Spike % Recovery | Accuracy Limit |
|-----------|--------|-------|--------------|----------------|-------|------------------|----------------|
| Lead | 6010 | 0729J | 0.517 | 0.500 | mg/l | 103 | 75-125 |
| Zinc | 6010 | 0729J | 0.524 | 0.500 | mg/l | 105 | 75-125 |
| Cadmium | 6010 | 0729J | 0.0516 | 0.0500 | mg/l | 103 | 75-125 |

ARCADIS G&M

Laboratory Task Order No./P.O. No. _____ Page _____ of _____

Project Number/Name CT001003.0007.0000/

Project Location AL Industries, Gwinnett City, IL
Laboratory STI - Savannah

Project Manager Jack Kratzewsky

Sampler(s)/Affiliation Hans Bruegger + Peter Bus AEGADIC

Date/Time

| Sample ID/Location | Matrix | Sampled | Lab ID | Total | Remarks |
|-----------------------|--------|---------|--------|-------|---------|
| GMMW. 123 (07/23/02) | L | 7/23/02 | 1715 | 1 | |
| GMMW. 165 (07/23/02) | L | 1 | 1613 | 1 | |
| GMMW. 165 (07/23/02) | L | 1 | 1608 | 1 | |
| GMMW. 165 (07/23/02) | L | 1 | 1525 | 1 | |
| GMMW. 155 (07/23/02) | L | 1 | 1425 | 1 | |
| GMMW. 155 (07/23/02) | L | 1 | 1344 | 1 | |
| GMMW. 124S (07/23/02) | L | 1 | 1256 | 1 | |
| GMMW. 124D (07/23/02) | L | 1 | 1227 | 1 | |
| GMMW. 125 (07/23/02) | L | 1 | 1133 | 1 | |
| Temp Blank | L | 1 | | | |

Example Matrix: $L = \text{Liquid}; S = \text{Solid}; A = \text{Air}$

Total No. of Bottles/
Containers

| | | | | |
|---------------------|------------------------------|----------------------|-------------------|---|
| Relinquished by: | Organization: | Date | Time | Seal Intact? |
| <u>John Bawford</u> | Organization: <u>JKC DDS</u> | Date <u>07/23/02</u> | Time <u>10:08</u> | <input checked="" type="checkbox"/> Yes |
| Received by: | Organization: <u>SJL-Saw</u> | Date <u>7/24/02</u> | Time <u>9:22</u> | <input type="checkbox"/> No |
| | | | | <input type="checkbox"/> N/A |
| | | | | <input type="checkbox"/> N/A |

Special Instructions/Remarks:
Questions: Jack Prather 312/263-6703. Email results to JKratzmeier@graham-isys.com

Delivery Method: In Person

Other _____ SPECIFY _____

LOG NO: S2-45285

Received: 25 JUL 02

Reported: 09 AUG 02

RECEIVED

Mr. Jack Kratzmeyer AUG 19 2002
 ARCADIS Geraghty & Miller, Inc.
 35 E. Wacker Dr., Suite 1000 ARCADIS G & M^l Project No: CI001003.0007.0001
 Chicago, IL 60601 Requisition: CI001003.0007.00001

Project: NL Industries

Sampled By: Client

Code: 151320813

Page 1

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ | TIME SAMPLED | | |
|---------------------|-------------------------------------|----------------|--------------|----------|----------|
| 45285-1 | GMMW-120 (7/24/02) | 07-24-02/08:28 | | | |
| 45285-2 | GMMW-122 (7/24/02) | 07-24-02/09:17 | | | |
| 45285-3 | GMMW-121 (7/24/02) | 07-24-02/09:58 | | | |
| 45285-4 | GMMW-121 DUP (7/24/02) | 07-24-02/10:00 | | | |
| 45285-5 | GMMW-119 (7/24/02) | 07-24-02/11:03 | | | |
| PARAMETER | 45285-1 | 45285-2 | 45285-3 | 45285-4 | 45285-5 |
| Lead (6010), mg/l | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Batch ID | 0801G | 0801G | 0801G | 0801G | 0801G |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

LOG NO: S2-45285

Received: 25 JUL 02

Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

C1 Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 2

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ TIME SAMPLED |
|---------------------|-------------------------------------|-----------------------|
| 45285-6 | GMMW-118 (7/24/02) | 07-24-02/11:42 |
| 45285-7 | GMMW-117 (7/24/02) | 07-24-02/12:28 |
| PARAMETER | 45285-6 | 45285-7 |
| Lead (6010), mg/l | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 |
| Analysis Date | 08.01.02 | 08.01.02 |
| Batch ID | 0801G | 0801G |
| Quantitation Factor | 1.0 | 1.0 |

LOG NO: S2-45285

Received: 25 JUL 02

Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

C1 Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries

Sampled By: Client

Code: 151320813

Page 3

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ TIME SAMPLED |
|----------------------|--|-----------------------|
| 45285-8 | GMMW-126 (7/24/02) | 07-24-02/14:21 |
| 45285-9 | MW-104 (7/24/02) | 07-24-02/15:18 |
| 45285-10 | GMMW-113D (7/24/02) | 07-24-02/16:07 |
| 45285-11 | GMMW-113S (7/24/02) | 07-24-02/16:40 |
| 45285-12 | MW-102 (7/24/02) | 07-24-02/17:25 |
| PARAMETER | 45285-8 45285-9 45285-10 45285-11 45285-12 | |
| Lead (6010), mg/l | <0.0050 <0.0050 <0.0050 <0.0050 <0.0050 | |
| Dilution Factor | 1 1 1 1 1 | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Analysis Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Batch ID | 0801G 0801G 0801G 0801G 0801G | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | |
| Zinc (6010), mg/l | <0.020 <0.020 <0.020 <0.020 <0.020 | |
| Dilution Factor | 1 1 1 1 1 | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Analysis Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Batch ID | 0801G 0801G 0801G 0801G 0801G | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | |
| Cadmium (6010), mg/l | <0.0050 <0.0050 <0.0050 <0.0050 <0.0050 | |
| Dilution Factor | 1 1 1 1 1 | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Analysis Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | |
| Batch ID | 0801G 0801G 0801G 0801G 0801G | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | |

LOG NO: S2-45285
Received: 25 JUL 02
Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

C1 Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 4

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ TIME SAMPLED |
|----------------------|-------------------------------------|-----------------------|
| 45285-13 | GMMW-103R (7/24/02) | 07-24-02/18:10 |
| PARAMETER | | 45285-13 |
| Lead (6010), mg/l | <0.0050 | |
| Dilution Factor | 1 | |
| Prep Date | 08.01.02 | |
| Analysis Date | 08.01.02 | |
| Batch ID | 0801G | |
| Quantitation Factor | 1.0 | |
| Zinc (6010), mg/l | <0.020 | |
| Dilution Factor | 1 | |
| Prep Date | 08.01.02 | |
| Analysis Date | 08.01.02 | |
| Batch ID | 0801G | |
| Quantitation Factor | 1.0 | |
| Cadmium (6010), mg/l | <0.0050 | |
| Dilution Factor | 1 | |
| Prep Date | 08.01.02 | |
| Analysis Date | 08.01.02 | |
| Batch ID | 0801G | |
| Quantitation Factor | 1.0 | |

LOG NO: S2-45285
Received: 25 JUL 02
Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

C1 Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 5

REPORT OF RESULTS

DATE /

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | TIME SAMPLED |
|--------|---|--------------|
|--------|---|--------------|

45285-14 Method Blank
45285-15 Lab Control Standard Result
45285-16 LCS Accuracy Control Limit (%R)
45285-17 Reporting Limit (RL)
45285-18 Method Detection Limit (MDL)

| PARAMETER | 45285-14 | 45285-15 | 45285-16 | 45285-17 | 45285-18 |
|----------------------|----------|----------|----------|----------|----------|
| Lead (6010), mg/l | <0.0050 | 0.473 | 75-125 % | 0.0050 | 0.0015 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Batch ID | 0801G | 0801G | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |
| Zinc (6010), mg/l | <0.020 | 0.482 | 75-125 % | 0.020 | 0.0059 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Batch ID | 0801G | 0801G | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |
| Cadmium (6010), mg/l | <0.0050 | 0.0470 | 75-125 % | 0.0050 | 0.00071 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Batch ID | 0801G | 0801G | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |

LOG NO: S2-45285

Received: 25 JUL 02

Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Cl Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 6

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | TIME SAMPLED |
|--------|---|--------------|
|--------|---|--------------|

45285-19 Spike Amount Added, LCS/LCSD

45285-20 Lab Control Standard % Recovery

| PARAMETER | 45285-19 | 45285-20 |
|----------------------|----------|----------|
| Lead (6010), mg/l | 0.500 | 95 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.01.02 |
| Batch ID | --- | 0801G |
| Quantitation Factor | --- | 1.0 |
| Zinc (6010), mg/l | 0.500 | 96 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.01.02 |
| Batch ID | --- | 0801G |
| Quantitation Factor | --- | 1.0 |
| Cadmium (6010), mg/l | 0.0500 | 94 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.01.02 |
| Batch ID | --- | 0801G |
| Quantitation Factor | --- | 1.0 |

LOG NO: S2-45285

Received: 25 JUL 02

Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Cl Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 7

REPORT OF RESULTS

DATE/

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | TIME SAMPLED |
|--------|---|--------------|
|--------|---|--------------|

45285-21 Matrix Spike Result
45285-22 Matrix Spike Duplicate Result
45285-23 Matrix Spike % Recovery
45285-24 Matrix Spike Duplicate % Recovery
45285-25 Spike Amount Added, MS

| PARAMETER | 45285-21 | 45285-22 | 45285-23 | 45285-24 | 45285-25 |
|----------------------|----------|----------|----------|----------|----------|
| Lead (6010), mg/l | 0.492 | 0.490 | 98 % | 98 % | 0.500 |
| Dilution Factor | 1 | 1 | 1 | 1 | --- |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Analysis Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Batch ID | 0801G | 0801G | 0801G | 0801G | --- |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | --- |
| Zinc (6010), mg/l | 0.506 | 0.509 | 100 % | 101 % | 0.500 |
| Dilution Factor | 1 | 1 | 1 | 1 | --- |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Analysis Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Batch ID | 0801G | 0801G | 0801G | 0801G | --- |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | --- |
| Cadmium (6010), mg/l | 0.0498 | 0.0502 | 100 % | 100 % | 0.0500 |
| Dilution Factor | 1 | 1 | 1 | 1 | --- |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Analysis Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | --- |
| Batch ID | 0801G | 0801G | 0801G | 0801G | --- |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | --- |

LOG NO: S2-45285
Received: 25 JUL 02
Reported: 09 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

C1 Project No: CI001003.0007.0001
Requisition: CI001003.0007.00001

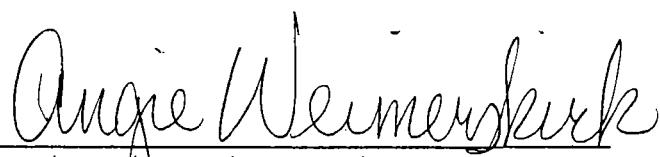
Project: NL Industries
Sampled By: Client
Code: 151320813

Page 8

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | TIME SAMPLED | DATE/ |
|----------------------|---|--------------|----------|
| 45285-26 | Spike Amount Added, MSD | | |
| 45285-27 | MS Accuracy Advisory Limit (%R) | | |
| 45285-28 | Precision (%RPD) MS/MSD | | |
| 45285-29 | MS Precision Advisory Limit (%RPD) | | |
| PARAMETER | | 45285-26 | 45285-27 |
| Lead (6010), mg/l | | 0.500 | 75-125 % |
| Zinc (6010), mg/l | | 0.500 | 75-125 % |
| Cadmium (6010), mg/l | | 0.0500 | 75-125 % |
| | | 0.70 % | <20 % |

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.



Angie Weimerskirk
Angie Weimerskirk, Project Manager

Final Page Of Report

LOG NO: S2-45321
Received: 26 JUL 02
Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 1

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE / TIME SAMPLED | | | | |
|----------------------|-------------------------------------|---------------------|----------|----------|----------|----------|
| PARAMETER | | 45321-1 | 45321-2 | 45321-3 | 45321-4 | 45321-5 |
| Lead (6010), mg/l | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Zinc (6010), mg/l | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Cadmium (6010), mg/l | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

HENRY FETTER

AUG 19 2002

ARCADIS GMBH

LOG NO: S2-45321
Received: 26 JUL 02
Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 2

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ TIME SAMPLED | | | |
|-----------------------|-------------------------------------|-----------------------|----------|----------|----------|
| 45321-6 | MW-106D (7/25/02) | 07-25-02/11:00 | | | |
| 45321-7 | MW-106S (7/25/02) | 07-25-02/11:43 | | | |
| 45321-8 | MW-107D (7/25/02) | 07-25-02/13:18 | | | |
| 45321-9 | MW-107S (7/25/02) | 07-25-02/12:27 | | | |
| 45321-10 | GMMW-108X (7/25/02) | 07-25-02/14:19 | | | |
| PARAMETER | 45321-6 | 45321-7 | 45321-8 | 45321-9 | 45321-10 |
| Lead (6010) , mg/l | <0.0050 | 0.020 | <0.0050 | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Zinc (6010) , mg/l | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Cadmium (6010) , mg/l | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 | 08.01.02 |
| Analysis Date | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 | 08.02.02 |
| Batch ID | 0801H | 0801H | 0801H | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

LOG NO: S2-45321

Received: 26 JUL 02

Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries
Sampled By: Client
Code: 151320813

Page 3

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE / | TIME SAMPLED |
|-----------------------|--|----------------|--------------|
| 45321-11 | MW-108D (7/25/02) | 07-25-02/14:50 | |
| 45321-12 | GMMW-108S (7/25/02) | 07-25-02/15:26 | |
| 45321-13 | MW-108D (7/25/02) | 07-25-02/14:51 | |
| 45321-14 | MW-101 (7/25/02) | 07-25-02/16:07 | |
| 45321-15 | GMMW-109S (7/25/02) | 07-25-02/16:49 | |
| PARAMETER | 45321-11 45321-12 45321-13 45321-14 45321-15 | | |
| Lead (6010) , mg/l | <0.0050 <0.0050 <0.0050 <0.0050 <0.0050 | | |
| Dilution Factor | 1 1 1 1 1 | | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | | |
| Analysis Date | 08.02.02 08.02.02 08.06.02 08.06.02 08.06.02 | | |
| Batch ID | 0801H 0801H 0801H 0801H 0801H | | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | | |
| Zinc (6010) , mg/l | 31 11 30 <0.020 <0.020 | | |
| Dilution Factor | 1 1 1 1 1 | | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | | |
| Analysis Date | 08.02.02 08.02.02 08.06.02 08.06.02 08.06.02 | | |
| Batch ID | 0801H 0801H 0801H 0801H 0801H | | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | | |
| Cadmium (6010) , mg/l | 6.0 1.9 5.7 <0.0050 <0.0050 | | |
| Dilution Factor | 1 1 1 1 1 | | |
| Prep Date | 08.01.02 08.01.02 08.01.02 08.01.02 08.01.02 | | |
| Analysis Date | 08.02.02 08.02.02 08.06.02 08.06.02 08.06.02 | | |
| Batch ID | 0801H 0801H 0801H 0801H 0801H | | |
| Quantitation Factor | 1.0 1.0 1.0 1.0 1.0 | | |

LOG NO: S2-45321

Received: 26 JUL 02

Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries

Sampled By: Client

Code: 151320813

Page 4

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE/ TIME SAMPLED |
|-----------------------|-------------------------------------|-----------------------|
| 45321-16 | GMMW-109D (7/25/02) | 07-25-02/17:28 |
| 45321-17 | GMMW-109X (7/25/02) | 07-25-02/18:05 |
| PARAMETER | | 45321-16 45321-17 |
| Lead (6010) , mg/l | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 |
| Analysis Date | 08.06.02 | 08.06.02 |
| Batch ID | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 |
| Zinc (6010) , mg/l | <0.020 | <0.020 |
| Dilution Factor | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 |
| Analysis Date | 08.06.02 | 08.06.02 |
| Batch ID | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 |
| Cadmium (6010) , mg/l | <0.0050 | <0.0050 |
| Dilution Factor | 1 | 1 |
| Prep Date | 08.01.02 | 08.01.02 |
| Analysis Date | 08.06.02 | 08.06.02 |
| Batch ID | 0801H | 0801H |
| Quantitation Factor | 1.0 | 1.0 |

LOG NO: S2-45321

Received: 26 JUL 02

Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries

Sampled By: Client

Code: 151320813

Page 5

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | DATE/ | TIME SAMPLED | | |
|-----------------------|---|----------|--------------|----------|----------|
| PARAMETER | 45321-18 | 45321-19 | 45321-20 | 45321-21 | 45321-22 |
| Lead (6010) , mg/l | <0.0050 | 0.449 | 75-125 % | 0.0050 | 0.0015 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.02.02 | 08.02.02 | --- | --- | --- |
| Batch ID | 0801H | 0801H | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |
| Zinc (6010) , mg/l | <0.020 | 0.453 | 75-125 % | 0.020 | 0.0059 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.02.02 | 08.02.02 | --- | --- | --- |
| Batch ID | 0801H | 0801H | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |
| Cadmium (6010) , mg/l | <0.0050 | 0.0452 | 75-125 % | 0.0050 | 0.00071 |
| Dilution Factor | 1 | 1 | --- | --- | --- |
| Prep Date | 08.01.02 | 08.01.02 | --- | --- | --- |
| Analysis Date | 08.02.02 | 08.02.02 | --- | --- | --- |
| Batch ID | 0801H | 0801H | --- | --- | --- |
| Quantitation Factor | 1.0 | 1.0 | --- | --- | --- |

LOG NO: S2-45321

Received: 26 JUL 02

Reported: 12 AUG 02

Mr. Jack Kratzmeyer
ARCADIS Geraghty & Miller, Inc.
35 E. Wacker Dr., Suite 1000
Chicago, IL 60601

Requisition: CI001003.0007.00001

Project: NL Industries

Sampled By: Client

Code: 151320813

Page 6

REPORT OF RESULTS

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES | TIME SAMPLED |
|--------|---|--------------|
|--------|---|--------------|

45321-23 Spike Amount Added, LCS/LCSD

45321-24 Lab Control Standard % Recovery

| PARAMETER | 45321-23 | 45321-24 |
|-----------|----------|----------|
|-----------|----------|----------|

| | | |
|---------------------|-------|----------|
| Lead (6010), mg/l | 0.500 | 90 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.02.02 |
| Batch ID | --- | 0801H |
| Quantitation Factor | --- | 1.0 |

| | | |
|---------------------|-------|----------|
| Zinc (6010), mg/l | 0.500 | 91 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.02.02 |
| Batch ID | --- | 0801H |
| Quantitation Factor | --- | 1.0 |

| | | |
|----------------------|--------|----------|
| Cadmium (6010), mg/l | 0.0500 | 90 % |
| Dilution Factor | --- | 1 |
| Prep Date | --- | 08.01.02 |
| Analysis Date | --- | 08.02.02 |
| Batch ID | --- | 0801H |
| Quantitation Factor | --- | 1.0 |

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

Angie Weimerskirk, Project Manager

ARCADIS G&M

Project Number/Name CIAW003.0007.00001 Laboratory Task Order No./P.O. No. _____CHAIN-OF-CUSTODY RECORD Page 1 of 2Project Location ME Industries, Granite City, IL
Laboratory STL - SavannahProject Manager Jack KratzmeyerSampler(s)/Affiliation Mousbrugger + Petersbusch- ARCADIS

| Sample ID/Location | Matrix | Sampled Date/Time | TIME LabID | ANALYSIS / METHOD / SIZE | Remarks | Total |
|------------------------|--------|-------------------|------------|--------------------------|---------|-------|
| TEMP BLANK | L | 07/25/02 | | X | | 1 |
| EQUIPMENT BLANK | | | | 1735 X | | 1 |
| GMMW-112D (07/25/02) | | | | 0818 X | | 1 |
| GMMW-112S (07/25/02) | | | | 0907 X | | 1 |
| MW-105D (07/25/02) | | | | 0951 X | | 1 |
| MW-105S (07/25/02) | | | | 1022 X | | 1 |
| MW-106D (07/25/02) | | | | 1100 X | | 1 |
| MW-106S (07/25/02) | | | | 1143 X | | 1 |
| MW-107D (07/25/02) | | | | 1318 X | | 1 |
| MW-107S (07/25/02) | | | | 1227 X | | 1 |
| GMMW-108X (07/25/02) | | | | 1419 X | | 1 |
| MW-108D (07/25/02) | | | | 1450 X | | 1 |
| GMMW-108S (07/25/02) | | | | 1526 X | | 1 |
| MW-108D-DUP (07/25/02) | | | | 1451 X | | 1 |
| MW-101 (07/25/02) | L | 07/25/02 | 1607 | X | | 1 |

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 15Relinquished by: Jack Kratzmeyer Organization: ARCADIS Date 07/25/02 Time 2:12 Seal Intact? Yes Yes No N/A
Received by: None Organization: None Date 7/26/02 Time 02 Seal Intact? Yes Yes No N/ARelinquished by: None Organization: None Date 1/1 Time 1 Seal Intact? Yes Yes No N/A
Received by: None Organization: None Date 1/1 Time 1 Seal Intact? Yes Yes No N/A

Special Instructions/Remarks:

EMI/ results to: JKratzmeyer @ arcadis-us.comQuestions: JACK KRATZMEYER 312/263-6723Delivery Method: In Person Common Carrier FedEx

SPECIFY

AG 05-097
SPECIFY52-45321 Lab Courier

ARCADIS G&M

Laboratory Ta
pp07 Group 1

Laboratory Task Order No./P.O. No. _____

CHAIN-OFF-CUSTODY RECORD

CHAIN-OF-CUSTODY RECORD Page of

Project Number/Name CJ001003 .00007.00001
Project Location NL Industries, Granite City, IL
Laboratory STL - Savannah
Project Manager Jack Kretzmer
Sampler(s)/Affiliation Mosbunger + Petersen
AB Controls

ARCADIS

Appendix C

Data Validation Memorandum

MEMO

ARCADIS
Ste 1000, 35 E. Wacker Dr.,
Chicago, IL 60601
Tel 312-263-6703
Fax 312-263-7897

To:
Jack Kratzmeyer

Copies:

ENVIRONMENTAL

From:
P. T. Srinivasan

Date:
September 09, 2002

Subject:

Inorganic Data Validation of Groundwater Samples Collected (during July 2002)
from the NL Industries, Taracorp Site, Granite City, Illinois.
CI001003.0003.00004

DATA VALIDATION

During the second annual groundwater sampling event at the NL Industries, Taracorp Site, Granite City, Illinois, thirty-five groundwater samples were collected from July 23, 2002 to July 25, 2002. Quality Control (QC) samples collected during the sampling event consisted of two field duplicates, one matrix spike (MS), one matrix spike duplicate (MSD), and one equipment blank. All samples were collected in pre-acidified (nitric acid) nalgene bottles as low-flow unfiltered (LFU) samples using a peristaltic pump. Approximately 1.5 to 2.5 gallons of groundwater were purged from each well while field parameters pH, temperature, dissolved oxygen and oxidation reduction potential (ORP) were monitored. Samples were collected once the field parameters had stabilized. At the end of each sampling day, samples were sent for analysis to the Severn Trent Laboratory (STL), located in Savannah, Georgia for analysis. A temperature blank was included with each sample batch. Twenty-nine samples were analyzed for target analyte list (TAL) metals consisting of total lead, cadmium and zinc. Six additional samples were analyzed for only total lead. Samples were analyzed for TAL metals using the standard U.S. Environmental Protection Agency (USEPA) SW-846 Method 6010. A limited data validation was performed following the general guidelines established in the individual USEPA Methods used and the quality assurance/quality control (QA/QC) criteria prescribed in the USEPA National Functional Guidelines for Inorganic Data Review, dated February 1994. ARCADIS received three data packages

from the laboratory, which were designated in three laboratory logs S2-42547, S2-45285, and S2-45321 respectively.

All three STL data packages were reviewed for completeness and technical compliance in accordance with the USEPA National Functional Guidelines for Inorganic Data Review referenced above. The review of the data packages included the following check points:

- Chain-of-custody forms.
- Holding times.
- Blank contamination (method blank and equipment blank).
- Field duplicates results.
- Laboratory control samples (LCS).
- Matrix spike/matrix spike duplicate.
- Groundwater sample logs.

The data were found to be of acceptable quality. Based on the data review, there is no qualification required to the data. The following observations are noted by laboratory log. Only non-conformance issues and deviations, if any, are discussed below.

STL: LOG NO: S2-45247

1. Eight groundwater samples and one field duplicate were collected on July 23, 2002. All samples were analyzed for total lead, cadmium and zinc.
2. Field duplicate was collected for GMMW- 116S (07/23/02) and labeled as GMMW-116S-Dup (07/23/02). The sample and duplicate results were comparable.
3. A method blank was analyzed with each batch of groundwater samples. No contamination was detected.
4. A laboratory control sample (LCS) was analyzed with each batch for the metals lead, cadmium and zinc. All percent recovery values fall within the laboratory established control limits (75-125%).

STL: LOG NO S2-45285

1. Fifteen groundwater samples (including a field duplicate, MS and MSD) were collected on July 24, 2002. Eight samples (including MS and MSD) were analyzed for total lead, cadmium and zinc. All other samples were analyzed for total lead only.
2. Field duplicate (for lead only) was collected for GMMW- 121 (07/24/02) and labeled as GMMW- 121. DUP. (07/24/02). The sample and duplicate results were comparable.
3. A method blank was analyzed with each batch of groundwater samples. No contamination was detected.
4. An LCS was analyzed with each batch for the metals lead, cadmium and zinc. All percent recovery values fall within the laboratory established control limits (75-125%).
5. MS/MSD analysis was performed using samples GMMW-113-MS (07/24/02) and GMMW-113-MSD (07/24/02) for the trace metals (lead, cadmium and zinc). All percent recovery and relative percent difference values were within the laboratory established control limits.
6. All other criteria evaluated were found to be acceptable.

STL: LOG NO S2-45321

7. Seventeen groundwater samples (including an equipment blank, and field duplicate) were collected on July 25, 2002. All samples were analyzed for total lead, cadmium and zinc.
8. Field duplicate was collected for GMMW- 108D (07/25/02) and labeled as GMMW-108D. DUP. (07/25/02). The sample and duplicate results were comparable.
9. An equipment blank was collected at the end of the sampling day and was analyzed with the 07/25/02 batch of groundwater samples for lead, cadmium and zinc. No contamination was detected.

10. An LCS was analyzed with each batch for the metals lead, cadmium and zinc. All percent recovery values fall within the laboratory established control limits (75-125%).
11. All other criteria evaluated were found to be acceptable.

ARCADIS

Appendix D

Monitoring Well Location and
Elevation Survey Data Results.

Juneau Associates, Inc., P.C.

2100 State Street, P.O. Box 1325
Granite City, Illinois 62040

Phone (618) 877-1400
Fax (618) 452-5541

TO: ARCADIS G&M, Inc.
35 E. Wacker Drive, Suite 1000
Chicago, Illinois 60601

LETTER OF TRANSMITTAL

DATE: 8/7/2002

JOB NO. 990277

ATTENTION: Kristina Lala

RE: NL Industries/Taracorp

WE ARE SENDING YOU Attached Under Separate cover via _____ the following:

| COPIES | DESCRIPTION |
|--------|---|
| 1 | Horizontal and Vertical locations of Monitoring Wells |
| | |
| | |
| | |
| | |

THESE ARE TRANSMITTED as checked below:

- For Approval As requested
 For your use For review and comment

REMARKS

Kristina,

If you have any questions or need any additional information, please do not hesitate to call. I appreciate the opportunity to be of service and hope we can work together on future projects.

Respectfully Submitted,

COPY TO

SIGNED:


J. Mark Carpenter

If enclosures are not as noted, kindly notify us at once.

ARCADIS Monitoring Well Location Survey

Survey by: Juneau Associates, Inc. P.C.

Date: July 27, 2002

| Point Number | NAD '83 | | NAVD '88 | | | Well Designation |
|--------------|-------------|-------------|----------|----------|-----------------------|------------------|
| | LATITUDE | LONGITUDE | PVC Pipe | Concrete | Asphalt/Gravel/Ground | |
| 1 | 38.69567506 | 90.15776509 | 422.27 | 420.32 | 419.81 | MW-108S |
| 2 | 38.69571831 | 90.15776559 | 422.55 | 420.63 | 420.09 | MW-108X |
| 3 | 38.69564291 | 90.15861898 | 421.21 | | 419.64 | MW-104 |
| 4 | 38.69814606 | 90.15865196 | 423.58 | | 420.92 | MW-106S |
| 5 | 38.69816140 | 90.15865148 | 423.52 | | 421.00 | MW-106D |
| 6 | 38.69740438 | 90.15864084 | 420.66 | | 419.26 | MW-107S |
| 7 | 38.69738729 | 90.15864007 | 421.57 | | 419.31 | MW-107D |
| 8 | 38.69870901 | 90.15860195 | 428.45 | 425.84 | 425.65 | MW-105D |
| 9 | 38.69872709 | 90.15862475 | 428.46 | | 425.65 | MW-105S |
| 10 | 38.69851742 | 90.15911850 | 422.38 | 422.79 | 422.74 | GMMW-116D |
| 11 | 38.69850114 | 90.15911827 | 422.35 | 422.81 | 422.73 | GMMW-116S |
| 12 | 38.69459286 | 90.15585065 | 416.12 | 413.70 | 413.51 | MW-102 |
| 13 | 38.69448367 | 90.15689461 | 416.46 | 414.53 | 414.11 | MW-112D |
| 14 | 38.69447799 | 90.15687440 | 416.44 | 414.47 | 414.01 | MW-112S |
| 15 | 38.69352463 | 90.15759704 | 417.18 | 415.15 | 414.68 | MW-103R |
| 16 | 38.69374280 | 90.15876330 | 418.47 | 416.52 | 416.23 | MW-109X |
| 17 | 38.69372560 | 90.15876686 | 418.50 | 416.17 | 416.01 | MW-109D |
| 18 | 38.69370868 | 90.15876971 | 418.48 | 416.45 | 416.11 | MW-109S |
| 19 | 38.69407853 | 90.15930374 | 418.44 | 418.85 | 418.79 | MW-115S |
| 20 | 38.69409384 | 90.15930231 | 418.53 | 418.86 | 418.85 | MW-115D |
| 21 | 38.69234532 | 90.15945472 | 417.82 | 418.20 | 418.17 | GMMW-124D |
| 22 | 38.69233372 | 90.15946503 | 417.75 | 418.11 | 418.05 | GMMW-124S |
| 23 | 38.69697848 | 90.15619688 | 421.17 | | 418.65 | MW-101 |
| 24 | 38.69393780 | 90.15590557 | 413.60 | 414.03 | 413.98 | GMMW-113S |
| 25 | 38.69396103 | 90.15589839 | 413.47 | 413.85 | 413.83 | GMMW-113D |